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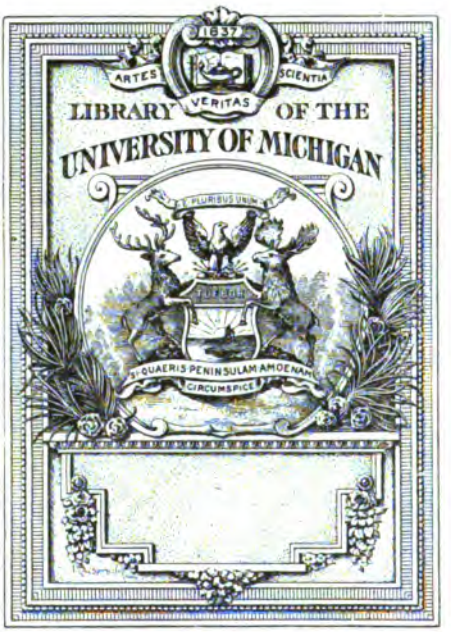

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VETERANS OF MINNESOTA HORTICULTURE.

Photographed Dec. 7, 1897. (See page 28).

ANNUAL REPORT

OF THE

Minnesota State Horticultural Society

1898.

EMBRACING THE
TRANSACTIONS OF THE SOCIETY FROM DECEMBER 7, 1897, TO DECEMBER 6, 1898, INCLUDING THE TWELVE NUMBERS OF
"THE MINNESOTA HORTICULTURIST"
FOR 1898.

EDITED BY THE SECRETARY,
A. W. LATHAM,
OFFICE AND LIBRARY, 207 KASOTA BLOCK,
MINNEAPOLIS, MINN.
Official Stenographer, A. G. Long, Excelsior, Minn.

VOL. XXVI.

MINNEAPOLIS:
HARRISON & SMITH, STATE PRINTERS,
1898.

LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY OF THE
MINNESOTA STATE HORTICULTURAL SOCIETY.

207 KASOTA BLOCK, MINNEAPOLIS, MINN., DEC. 6, 1898.

To the Hon. D. M. Clough, Governor of Minnesota:

SIR:—In compliance with the requirements of the law, I have the honor to submit herewith the report of our society from December 7, 1897 to December 6, 1898.

Respectfully yours,

A. W. LATHAM,

Secretary.

THE MINNESOTA HORTICULTURIST.

VOL. 26. JANUARY, 1898. No. 1.

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OF THE

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COMMITTEES FOR 1898.

FRUIT LIST.

Clarence Wedge.....Albert Lea
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Prof. S. B. Green.....St. Anthony Park

SEEDLING FRUITS.

J. S. Harris.....La Crescent

ORNAMENTAL LIST.

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L. R. Moyer.....Montevideo
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Prof. S. B. Green.....St. Anthony Park

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D. R. McGinnis.....St. Paul
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A. W. Latham.....Minneapolis

PUBLICATION.

Prof. S. B. Green.....St. Anthony Park
Wyman Elliot.....Minneapolis
A. W. Latham.....Minneapolis

For constitution of the society, see page 6, Report of 1895.

FRUIT LIST, 1898.

FOR THE GUIDANCE OF PLANTERS IN MINNESOTA.

Adopted by the Minnesota State Horticultural Society, December 8, 1897.

APPLES.

Of the first degree of hardiness for planting in Minnnesota: DUCHESS *(a)* (see foot note), HIBERNAL *(b)*, CHARLAMOFF *(c)*.

Of the second degree of hardiness: Wealthy *(d)*, Longfield *(d)(y)*, Tetofsky, Malinda *(x)(d)*.

Promising varieties for trial: Patten, Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet *(x)*, Kaump *(y)*, Gilbert, Brett, Christmas *(x)*, Blushed Calville, Cross 413, White Pigeon *(y)*.

CRABS AND HYBRIDS.

Best for general cultivation: Virginia, Martha, Whitney, Early Strawberry, Minnesota *(x)*, Sweet Russet, Gideon's No. 6, Briar's Sweet, Tonka.

Promising varieties for trial: Dartt, Greenwood, Pride of Minneapolis, Crampton's No. 3, Lyman's Prolific.

PLUMS.

Best for general cultivation: Desota, Forest Garden, Weaver, Cheney, Wolf, Rollingstone.

Most promising varieties for trial: Rockford, Wyant, Ocheeda, New Ulm, Stoddard, Surprise, Mankato, Aitkin.

GRAPES.

Concord, Delaware, Moore's Early, Worden, Agawam, Brighton, Janesville *(z)*.

RASPBERRIES.

Red varieties: Marlborough, Turner, Cuthbert, Brandywine.

Black and purple varieties: Ohio, Palmer, Nemaha, Gregg, Schaffer, Older, Souhegan.

BLACKBERRIES.

Ancient Briton, Snyder, Badger.

CURRANTS.

Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland, North Star.

GOOSEBERRIES.

Houghton, Downing. Varieties for trial: Red Jacket, Triumph, Pearl.

STRAWBERRIES.

Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Capt. Jack, Wilson, Enhance, Lovett.

NATIVE FRUITS.

Valuable for trial: Dwarf Juneberry, Sand Cherry.

(*a*) Borovinka and Glass Green resemble the Duchess and are equally safe kinds.

(*b*) Lieby (Recumbent), Juicy Burr and Romna closely resemble the Hibernal and are equally safe kinds.

(*c*) Peterson's Charlamoff.—There are two distinct kinds under this name; the one here referred to is of spreading growth and bears conical-shaped fruit.

(*d*) Does best top-worked.

(*x*) Tardy bearer. (*y*) Early bearer. (*z*) For severe situations.

After the presentation and adoption of the foregoing list at the annual meeting, an expression was asked for from the members present, first, as to how many had tried the variety in question and, second, how many would recommend it. The result of the balloting is shown in the following record:

APPLES.

Of the first degree of hardiness:

Variety.	No. having tried it.	No. recommending it.
Duchess	25	25
Hibernal	20	21
Charlamoff	8	7
Of the second degree of hardiness:		
Wealthy	27	27
Longfield	10	10
Tetofsky	24	16
Malinda	9	5
Promising varieties for trial:		
Patten	15	15
Okabena	8	7
Peerless	14	9
Repka Malenka	5	3
Anisim	7	7
Yellow Sweet	4	3
Kaump	1	1
Gilbert	2	1
Brett	4	3
Christmas	5	5
Blushed Calville	3	2
Cross 413	4	4
White Pigeon	3	2

CRABS AND HYBRIDS.

Best for general cultivation:		
Virginia	13	18
Martha	13	11
Whitney	24	21
Early Strawberry	21	17
Sweet Russet	8	7
Gideon's No. 6	6	4
Briar Sweet	11	7
Tonka	6	5
Promising varieties for trial:		
Dartt	7	5
Greenwood	5	3
Pride of Minneapolis	7	4

Mr. E. H. S. Dartt: I want to say about the Dartt that it is a seedling of the Tetofsky, and its quality is No. 1 for canning purposes. My housekeeper said to me I might brag up the Dartt all I wanted to for canning, and I would not get it too high. The fruit looks pretty on the tree, and the quality and flavor are A No. 1. It is a fine tree, and it is one hundred times better than the Hyslop. I have a good many other seedlings of the Tetofsky, and they all resemble the parent, and

among those you will get a good crab twenty years from now. The Greenwood is a hardy tree, but the fruit is not of a good color; it ripens early, but is good for nothing in the market. It is a good thing to have when you have no others. One year I had more Greenwood crabs than I had on two or three thousand trees of all other varieties put together. It is a good tasting crab. One man told me his boys would fill their pockets with Greenwood crabs when the Duchess were lying all around.

ORNAMENTAL LIST, 1898.

REPORT OF COMMITTEE.

F. H. NUTTER, Minnneaplis; LYCURGUS R. MOYER, Montevideo.

HARDY TREES AND SHRUBS ADAPTED TO PARK AND LAWN PLANTING IN MINNESOTA.

SIGNS USED AND THEIR SIGNIFICANCE.

* Adapted to general planting throughout the state.
† Adapted to temporary planting. Is short lived.
‡ Well adapted to moist localities.
§ Best adapted to rich, moist soil.
¶ Requires shelter and moist soil.
| Doing well on prairie at Montevideo Trial Station.
° Attains its best development on river banks.

DECIDUOUS TREES.

Bur Oak (Quercus macrocarpa). * ‖
Scarlet Oak (Quercus coccinea).
Green Ash (Fraxinus lanceolata). * ‖ (*a*) see foot note.
Basswood (Tilia Americana). §
White Elm (Ulmus Americana). ‡ ‖
Cork Elm (Ulmus racemosa). ‖ (*b*)
Slippery Elm (Ulmus pubescens). § ‖
Hackberry (Celtis occidentalis). * ‖ *(c)*
Hop Hornbeam (Ostrya Virginiana). ‖
Coffee Tree (Gymnocladus dioicus). ‖ (*d*)
Box Elder (Acer negundo). †
Silver Maple (Acer saccharinum). ‡ °
Sugar Maple (Acer saccharum). ¶
Black Sugar Maple (Acer nigrum). ¶
Cottonwood (Populus deltoides). ‡ °
Black Poplar (Populus nigra). ‖
Crack Willow (Salix fragilis). ‡ ‖
White Willow (Salix alba). ‡
Golden Osier (Salix alba vittelina). ‖ (*e*)
Bitternut (Hicoria minima). ‡
Black Walnut (Juglans nigra). §
Butternut (Juglans cinerea). §

CONIFERS.

White Spruce (Picea Canadensis). *
Blue Spruce (Picea pungens).
Douglas Spruce (Pseudotsuga taxifolia).
Scotch Pine (Pinus sylvestris).
Western Yellow Pine (Pinus ponderosa).
Mountain, or Mugho, Pine (Pinus montana). *
Red Cedar (Juniperus Virginiana). *
Shrubby Red Cedar (Juniperus Sabina).
Arbor Vitæ (Thuja occidentalis). ‡
Siberian Arbor Vitæ (Thuja sp.).

SHRUBS.

Scarlet Thorn (Crataegus coccinea).
Common Lilac (Syringa vulgaris). *
White Lilac (Syringa vulgaris var.) *
Charles X Lilac (Syringa vulgaris var.) (*f*) *
Tree Lilac (Syringa Japonica).
Persian Lilac (Syringa Persica). *
White Persian Lilac (Syringa Persica alba).
North China Lilac (Syringa villosa).
Lady Josika's Lilac (Syringa Josikœa).
Mock Orange (Philadelphus coronarius).
Gordon's Mock Orange (Philadelphus Gordonianus). *
Large Flowered Mock Orange (Philadelphus grandiflorus). *
Showy Mock Orange (Philadelphus speciosissimus.) *
Russian Mock Orange (Prof. Budd's No. 144 Vor). *
Golden Currant (Ribes aureum). *
Wild Black Currant (Ribes Floridum). * *(r)*
Cranberry Tree (Viburnum opulus). *(r)*
Snowball (Viburnum opulus sterilis). *
Sheepberry (Viburnum Lentago). *(g)*
Wayfaring Tree (Viburnum lantana).
Pink Bush Honeysuckle (Lonicera Tartarica). *
White Bush Honeysuckle (Lonicera Tartarica alba). *
Splendid Honeysuckle (Lonicera splendens). *
Albert's Honeysuckle (Lonicera Albertii). * *(h)*
Shining Honeysuckle (Lonicera glauca). * *(i)*
Common Elder (Sambucus Canadensis). *(r)*
Red-Berried Elder (Sambucus pubens). * *(k)(r)*
Shad Bush (Amelanchier botryapium). *
Northwestern Juneberry (Amelanchier alnifolia). * *(r)*
Success Juneberry (Amelanchier sp). *
Japanese Rose (Rosa rugosa), pink and red forms. *
American Mountain Ash (Sorbus Americana). *(r)*
Western Mountain Ash (Sorbus sambucifolia).
European Mountain Ash (Sorbus accuparia). *(l)*
Ninebark (Opulaster opulifolius). *
Van Houtii's Spiraea (Spiraea Van Houtii). *
St. Peter's Wreath (Spiraea hypericifolia). *
Ash-Leaved Spiraea (Spiraea sorbifolia).

Willow-Leaved Spiraea (Spiraea salicifolia). † *
Douglas' Spiraea (Spiraea Douglasi).
Choke Cherry (Prunus Virginiana.) ‖ * *(r)*
Western Wild Cherry (Prunus demissa).
Wild Red Cherry (Prunus Pennsylvanica). ‖ * *(r)*
Bessarabian Cherry (Prunus cerasus var). ‖ * *(m)*
Bird Cherry (Prunus padus). ‖
Sand Cherry (Prunus pumila). ‖ * *(n)(r)*
Wild Plum (Prunus Americana). * *(r)*
Buffalo Berry (Lepargyraea argentea). * *(o)* ‖ *(r)*
Silverberry (Elaeagnus argentea). *(r)*
Russian Olive (Elaeagnus hortensis songorica). * *(o)*
European Barberry (Berberis vulgaris). ‖ *
Amur Barberry (Berberis amurensis). ‖ *
Rosemary Willow (Salix rosmarinifolia). ‖ *
Siberian Pea Tree (Caragana arborescens). ‖ * *(p)*
Small-Leaved Pea Shrub (Caragana microphilla). ‖ *
Chinese Pea Shrub (Caragana chamlagu).
Siberian Pea Shrub (Caragana frutescens). ‖ *
Dwarf Pea Shrub (Caragana pigmaea). ‖ *
Smooth Sumac (Rhus glabra). ‖ * *(r)*
Staghorn Sumac (Rhus hirta). *(r)*
Buckthorn (Rhamnus cathartica). ‖ *
Red Osier Dogwood (Cornus stolonifera). ‖ * *(r)*
Panicled Cornel (Cornus paniculata). *(r)*
Kinnikinick (Cornus sericea). *(r)*
Amur Tamarix (Tamarix amurensis). ‖ * *(s)*
Snowberry (Symphoricarpos racemosus). ‖ *
Matrimony Vine (Lycium vulgare). ‖ *
Manchurian Maple (Acer Tartaricum ginnala). ‖ *
Burning Bush (Euonymus atropurpureus). ‖ * *(r)*

SHRUBS WITH COLORED FOLIAGE.

Variegated Elder (Sambucus var.) ¶
Golden Elder (Sambucus nigra aurea).
Golden Ninebark (Opulaster opulifolius aurea). ‖ *
Purple Barbery (Berberis vulgaris purpurea). ‖ *
The Russian Olive and the Buffalo Berry have silvery leaves.

CLIMBING VINES.

Sullivant's Honeysuckle (Lonicera Sullivantii). *(j)* ‖ *
Russian Honeysuckle (Lonicera media). ‖
Virginia Creeper (Parthenocissus quinquefolia). * ‖ *(t)*
Northern Fox Grape (Vitis labrusca). *
Riverside Grape (Vitis vulpina). *
Virginia Virgin's Bower (Clematis Virginiana). *
Jackman's Clematis (Clematis Jackmanii). ‖
Climbing Bittersweet (Celastrus scandens). ‖ *

(*a*) Nearly all the Ash found in the prairie portions of the state are Green Ash.
(*b*) Cork Elm is frequent throughout the Minnesota valley, growing on rocky land and bluff sides. It is better adapted to dry locations than White Elm.

(*c*) The Hackberry is common to the timber lands of southern Minnesota, and has been found as far north as Rainy Lake. It is an ornamental tree of the greatest merit. It is doing exceedingly well on dry prairies at Montevideo.

(*d*) The Coffee tree has been found growing wild in the Minnesota valley as far west as New Ulm. It is a unique tree, with something of a tropical aspect. It is succeeding at Montevideo on a dry bluff side. The young leaves in June are of a rich brown color and very beautiful.

(*e*) *Salix alba vittelina* is valuable for the winter effect of its bright red twigs. Seen in sunshine against a dark background it lights up the winter landscape as with a flame of fire.

(*f*) The Lilac is a grand shrub in Minnesota. The variety Charles X appears to be better than the typical *Syringa vulgaris*.

(*g*) The Sheepberry is a native shrub found throughout the state. It is beautiful in bloom, in foliage and in fruit. It is not too much to say that nothing better from the lawn planter's point of view has yet been introduced into the state. It does best in a somewhat moist location.

(*h*) Albert Hegel's Honeysuckle is quite dwarfed, very fragrant and well adapted to a positition in front of the shrub border. It is a trailing plant and should be tied up to a stake.

(*i*) This is a common native Honeysuckle of great beauty. It responds well to good cultivation and if kept tied up to a stake becomes one of the most striking objects in the shrub border. It is beautiful in flower, has fine foliage and in autumn is covered with scarlet berries.

(*j*) Sullivant's Honeysuckle is also known as *Lonicera flora*. It is a fine climber, The flowers are inconspicuous, but it produces showy red fruit.

(*k*) The Red-Berried Elder is a native shrub of great vigor, adapted to general planting.

(*l*) The European Mountain Ash has failed as a tree at Montevideo from sun-scald. Treated as a shrub and allowed to sprout freely from the roots it has been very successful.

(*m*) The Bessarabian Cherry may be expected to produce valuable fruit when it attains some age.

(*n*) The Sand Cherry possesses much merit where a low growing shrub is required. Its leaves color beautifully in the autumn.

(*o*) The Buffalo Berry and the Russian Olive are excellent shrubs with silvery foliage. If used in ornamental plantations, they should have a back ground of dark foliaged trees or shrubs. They both make excellent windbreaks on the prairie.

(*p*) The Pea Shrubs are extremely hardy, thriving in the most exposed locations.

(*r*) Native Shrubs.

(*s*) This Tamarix from Russia is very fine and very valuable. One would think it to be a tender exotic, but it endures the Minnesota winters without protection.

(*t*) Better known under the name of Ampelopsis quinquefolia.

The recent changes in botanical nomenclature have resulted in producing some confusion in our lists. We have endeavored to follow in the list the nomenclature of "Britton and Brown's Flora," the latest authority on the subject. This is the standard of our state university, and is in accordance with the practice of the forestry division of the Department of Agriculture. We have derived much assistance from Sudworth's "Nomenclature of the Arborescent Flora of the United States," lately issued by the Department. The nomenclature of garden varieties of trees and shrubs is still in a chaotic condition, each nurseryman, with a few honorable exceptions, claiming the privilege of naming his stock to suit his own taste and fancy.

The attention of propagators is particularly invited to the native shrubs mentioned in the foregoing list. It is through the cultivation and improvement of these that the greatest advances are to be made in the future. The patient cultivator will soon be rewarded

by obtaining garden varieties of more value from the lawn planter's point of view than the original species, while selected specimens from the swamps and woodlands may occasionally present striking and unique habits of growth.

Mr. Clarence Wedge: This is a paper I appreciate very much. Some of those foot notes ought to be a very excellent guide. I would like to ask Judge Moyer what the black poplar is and whether the hopwood, sometimes called the ironwood, is adapted to exposed situations at all?

Judge Moyer: The black poplar was sent out under the name of Populus betulifolia, or birch leafed poplar, but in reading the bulletin published by Prof. Bailey, of Cornell, I found it was the black poplar of Europe, and the proper name was Populus nigra, and it is now found in the forests of New England. However, it is a European tree and properly named the black poplar. It is more thrifty than the cottonwood.

Mr. Wedge: Is it ever called the Norway poplar? We have a tree with us that is called by that name.

Judge Moyer: I presume possibly it may be the same thing. It is the common poplar of Europe; perhaps it is the same thing. One question you asked in regard to the hop tree. I called it by the name of hop tree, but it is always called ironwood.

Mr. Wedge: Is it adapted to common use?

Judge Moyer: Its leaves stay on all winter; in that respect it is like our red oak. It is common at our place on the bluffs. I have not been so very successful in introducing it on the dry bluffs. I think it has to be treated the same as hard maple.

Mr. Lord: Did you ever succeed in getting the seed?

Judge Moyer: No, I have not.

Mr. Lord: Does it grow large?

Judge Moyer: It never grows very large.

Mr. Elliot: I have seen it a foot through.

Judge Moyer: It is very common through the Minnesota valley, along the Minnesota river. It is said to grow at Miner Lake; so it is a hardy tree. It grows about as fast as the box elder, and is a very handsome, attractive appearing tree. One peculiarity about it is that the leaves always hang with one edge up so as to give the tree a sort of tropical appearance. It is a peculiarity of the leaves that the edges always turn up. The only objection I have to the tree is that it leaves out very late in the spring; it is about the last tree to obtain its foliage. It

leaves out right down on the trunk first, and the top is the last to leave out.

The President: What is the value compared with the elm?

Judge Moyer: It is as good as the elm, but it will not make as large a tree.

Mr. Allan: It is used as a street tree.

Judge Moyer: I have been very much pleased with the rock elm. It grows very well with us; it is a native of the Minnesota valley.

Mr. Wedge: Does it grow as fast as the white elm?

Judge Moyer: No, I think not.

The President: It is a handsome tree.

Judge Moyer: Yes, it is a very handsome tree.

The President: What do you think of the black ash?

Judge Moyer: I have never tried that.

Mr. Elliot: It does not make a very rapid growth on dry soil.

Judge Moyer: It grows fifty miles north of us on the Chippewa river. Our native ash is the green ash. I have heard it called the white ash, but it is not. I do not know of any tree to plant on the prairie better than our native ash.

Mr. Underwood: In regard to this paper, I heartily concur with Mr. Wedge that it is a most excellent and valuable paper, and I think our society is exceedingly fortunate to have a gentleman in its membership who is capable of producing such an excellent paper. A word about the ash. I have been trying to locate the different kinds of ash, determine them definitely, and I have a block of trees that I think were taken from the woods as young trees and planted out. Among them I had rows of ash, elm, maple, box elder and different kinds, and they got mixed up some. A man brought those trees along one day and wanted to sell them, and we bought them as lawn trees. I was struck this summer by the very dark appearance of six of these trees. I said, "There are some handsome maples." I had not noticed them before. They were probably four inches in diameter or over, large, thrifty, nice trees, and as I approached them I saw they were not maples. I looked at the top and concluded they were butternuts, or some nut bearing tree. When I got nearer to them still I found they were a variety of ash. I had long been wanting to determine what the ash was that we are growing here, and, so far as I have been able to locate it, it seems to be the common ash we have been growing is the green ash. I used to call it the white ash, and I was

not satisfied as to what those half dozen trees were. I got out our botany and our encyclopedias, and Henderson; I got all the authority I could, and asked everybody I saw, especially woodsmen; I think they are usually good authority, men accustomed to the woods; and I finally located those half dozen trees as being black ash. They were certainly thrifty, growing in gravelly soil, and never had particularly good care, but under the same circumstances that the other trees were planted they were stronger growing than almost anything else, stronger than any ash I ever saw, and a very handsome tree. If Judge Moyer can give me any light on the subject as to whether they are black ash from the poor description I have given of them, or anything with regard to this common ash that grows along the Mississippi river, whether it should be called the green ash or what it should be called, I would be very glad to know. I noticed this, there is a variation in all trees such as the elm and ash. Take the seed and plant it and you will find there is a great deal of variation in the trees; you will get a tree that is different from anything else. For instance, take this tree we call the green ash. You see them growing together, and in fifty trees there will apparently be a half dozen varieties, but they are all grown from the seed of the trees growing along the Mississippi river. Perhaps Judge Moyer can tell us more about the ash.

Mr. Arthur Bryant, (Illinois) :What do you think of the blue ash?

Judge Moyer: I am not familiar with it.

The President: I do not think I have ever seen it.

Judge Moyer: I have lived in western Minnesota since I came to the state and am not acquainted with eastern Minnesota. I have seen the black ash growing at Glenwood in the western part of the state, on bottom lands where springs come down. It is a longer lived tree that the green ash. I noticed when Prof. Arthur reported on the ash trees in Iowa, he reported that nearly all of the ash trees in Iowa were green ash, and I think we will have to come to the same conclusion in Minnesota, in the western and southwestern part of the state, at least. I do not know the white ash well enough to know whether it is common in this neighborhood or not. I do not believe there is much white ash in the state, although Prof. MacMillan reported in a bulletin that it grows throughout Minnesota.

Mr. Lord: I have not a scientific knowledge of the different kinds of ash. A few years ago our station shipped a large quantity of ash seed to different portions of North Dakota, and also to some of the eastern states, and one of my neighbors took a special interest in the matter and shipped a great many bushels. He had an order from a Milwaukee firm for some white ash seed. He went down to the river bottom, (this is to my certain knowledge) he went down to the river bottom and gathered up the seeds, several sacks, and shipped them to Milwaukee, and the man who ordered them said only one-half were white ash, the rest were green ash, and he did not order green ash. (Laughter).

CHAS. A. DANA AS A HORTICULTURIST.—In the death of this talented man, well known as the editor of the New York Sun, horticulture loses one of its most intelligent and ardent friends. The Orange Judd Farmer says of him in a late number: "As an expert in horticulture and especially arboriculture he had few equals. At his summer home, Dosoris, an island of about sixty acres in the Long Island sound, he had brought together—almost regardless of expense—every species of ornamental tree and shrub that would live in the locality. In conifers, particularly, his collection is remarkably complete. Of most kinds there is but one specimen, and, owing to the limited space, many of the trees had to be pruned severely so as not to encroach upon and disfigure others. It is safe to assert that no other spot of equal size on earth contains so many different kinds of trees and shrubs as Dosoris. No less complete are the vegetable and flower gardens.

Although the original object in establishing these grounds was to serve as a means of recreation, they have gradually developed into an arboretum of high scientific value, as Mr. Dana was not a mere amateur in this line, but thoroughly familiar with the names, characteristics, history and systematology of every plant on his place. It is to be regretted that these grounds are not within the limits of Greater New York, as no better investment could be made than to have Dosoris preserved as a public botanical garden to perpetuate this magnificent collection and to serve as a monument to its founder, whom every student of trees and plants will hold in grateful and lasting rembrance."

Readers of "Gardening," a high class New York horticultural periodical, have had an opportunity to become very familiar with Dosoris, as a great number of fine half-tone views of those famous grounds have been published of late years in its pages. They can be seen in our library.—*Secy.*

Official Reports.

PRESIDENT'S ANNUAL ADDRESS.

J. M. UNDERWOOD, LAKE CITY.

Members of the Minnesota State Horticultural Society:—A review of the events of the past year brings with it a feeling of sadness as in thought we dwell upon the loss the society has sustained through the death of some of its most valuable members. Their counsel, drawn from the storehouse of ripe experience, will be greatly missed. Ever ready with their strong support to advance all horticultural projects, personal interests and profit were laid aside that questions of vital importance and general interest to the society might be considered. But brief mention of the different ones will be indulged in, as the usual committee will present suitable resolutions for adoption.

Martin W. Cook, of Rochester, was the first to lay his work aside. Never very strong in health, yet he was a most systematic and thorough workman. Very modest and unassuming in his ways, his genial kindness will ever be remembered by his friends.

E. J. Cutts, of Howard Lake. Earnest and successful in his work, his crowning labor had taken form as instructor in horticulture at the Farmers' Institutes. It will be a difficult task to find one who can fill his place.

Michael Pearce, of Chowen. A man of strong personality, vigorous in speech. He was always to be found in the front rank and never shrank from any call to duty.

Warren W. Pendergast, of Hutchinson. It is hard to be called upon to part with one so young. He would have brought to the horticultural world the vigor and strength of early manhood, accompanied by rare ability and education.

Just before the present meeting, the word comes that the ranks have again been broken by the death of William Danforth, of Red Wing. His benevolent heart, that found expression in his genial face and kindly, quiet ways, will always be remembered by his many friends.

One and all have left examples of self-sacrificing interest in horticulture, that have been the means of placing the work in the front rank of progressive achievements. May we honor them by taking up our line of duty with renewed energy.

In the work of the past year the society has been extremely fortunate in having so competent and faithful a secretary to care for its interests during the time intervening between the meetings. He has succeeded in publishing monthly reports, although it looked at one time as though it would be an utter impossibility to go on with them, through lack of an appropriation. Relief was found and it

is to be hoped that the good work of the society in fostering and developing the fruits and flowers of Minnesota, as well as all other features of horticulture, will appeal to the generosity and sense of justice of the next legislature, and that it will confer upon us an appropriation commensurate with the importance of the work.

In membership there has been a very satisfactory increase, and the society may justly congratulate itself upon having accomplished, through its magazine, an uplifting and elevating mission in carrying to those who were unable to be present at its meetings the gospel of advanced horticulture. It has found its way into nearly 700 homes—but how small that number seems compared with the many in which it ought to be received! It should be placed in the hands of every tiller of the soil, and the state legislature could do no better work than to provide for doing it.

In this age of rapid progress and development, women are taking prominent positions and filling them with great credit. Naturally interested in everything that pertains to the beautifying of home and its surroundings, they have widened the range of their influence. The Minnesota Federation of Women's Clubs are taking up practical work along lines that are of the deepest interest to us. In their papers on "Town and Village Improvement," their committees, appointed to plan and work for the same, evince appreciation of the need for improvement, and their determination to bring about reform. It is suggested that the horticultural society authorize its women members to form a club (so as to be eligible to admission —no men being allowed) so as to join the federation, thereby being entitled to send one or more delegates, who would help the horticultural society to keep in touch with this strong organization. It would also be a means of showing due appreciation of the great efforts they are making for the improvement of the state. Rest assured that in this way the society can enlarge its influence for good.

The State School of Agriculture demands our enthusiastic encouragement and strong support, for assuredly from it may be expected the hard working and well informed members of the future.

The Farmers' Institutes have done yeoman's service for horticulture. They have not exactly made a horticulturist of a Jersey cow, but they have come the next thing to it in making a horticultural lecturer of our friend, Prof. O. C. Gregg. Let the good work go on, until Theo. Lewis gives up the swine and preaches apples.

As was expected, the display of flowers and fruits at the last state fair was a grand success, and from this on it should be the aim of the secretary to see that permanent features of horticultural art be introduced and made prominent, so that lasting lessons of refinement and culture will be learned by farmers from all over the state; until the farm—*every* farm—is made as attractive as the city for the boys and girls who grow up there—yes, so attractive that the many in our cities who find it hard to make a living will see how much better off they would be in the country.

The bill presented to our last legislature for the preservation of cut-over pine lands suffered defeat. It could not have been from an intelligent objection to the bill, but rather from lack of time to become familiar with it and to understand its provisions and to appreciate its merits. The legislative committee should be prepared to lay before each member of the next assembly a copy of the bill with an explanation of its provisions, and, with ample time given to properly consider them, surely it would appeal to their intelligent and favorable action and secure the passage of the bill. The same can be said of the San José scale bill. It was a new question that needed to be understood. Our own members did not have time to fully consider and comprehend the nature of the bill, so that, unfortunately, some of the most intense opposition came from them. Under these conditions it was hardly to be expected that the legislature would be favorable to it. The bill was all right and only needed to be understood to appeal to the good sense of every intelligent and well informed citizen. Already it is announced that the San José scale is in our state and that it passed through last winter without injury. We are confronted with even a worse "scale" than that. Other states having passed the most stringent laws for stamping out the evil have hereby thrown upon Minnesota a fresh influx of scaly tree dealers, who rather than furnish the bonds required by law to protect the purchaser come to Minnesota and Iowa, where unmolested and supported by their friends within our borders, they vigorously ply their trade, full of snares and traps for the unwary.

The last summer meeting was perhaps the most enjoyable of all our gatherings. Coming at a season of the year when nature was at its best, lavish with almost endless varieties of flowers and strawberries, and also held at the State School, nothing was lacking to render it complete. There was a large attendance and an excellent program. Every member should be on hand for the next summer meeting. In connection with this, I would suggest that our society arrange with the executive committee of "The American Pomological Society" and the "Park and Out-Door Art Association" to meet with us. The former society has heretofore only held meetings once in two years, but contemplate making a change to annual meetings. It has for its members the leading pomologists of the United States. An arrangement of this kind would bring together an aggregation of interests that would be of incalculable value to us and reflect credit on Minnesota. "The Park and Out-Door Art Association" is a new organization, which has for its object the improvement of cities and towns, by laying out parks and improving streets, besides extending its influence to the maintenance of good roads in the country, and in every way it upholds the features expressed by its name.

The horticultural interests of our state are steadily improving. Better methods of culture are being adopted as the requirements and conditions are more thoroughly understood. New varieties of fruits and plants are springing up in great numbers. It will require careful and systematic work to properly record their value, and our

committee on seedlings certainly has an important work to perform. It is greatly to our credit to discover or introduce a new fruit or plant. Although it is not attended with so great dangers as is the the flight of Andree in his balloon to discover the North Pole, still there is danger that the law will not protect the interests of the introducer in his rights, while any little device of a mechanical nature that may not have required much time or sacrifice is fully protected to the person who discovers it. Would it not be well for our society to invite the co-operation of the American Pomological Society and the horticultural societies of other states to secure the passage of a law at this session of congress that will secure to the discoverer of a new creation in horticulture a patent that will protect him in its introduction?

Finally—may our efforts in horticulture prosper! May health and prosperity surround you, and success crown the work of our society!

REPORT ON PRESIDENT'S ADDRESS.

F. W. KIMBALL,
A. K. BUSH,
D. T. WHEATON,
} Committee.

To the Members of the State Horticultural Society:

Your committee on the president's address beg leave to say, that the short time elapsing between the delivery of the address and the report of the committee is hardly ample to do full justice to a production so good and able, and would recommend that in the future the president's address should come earlier in the sessions. We congratulate the society upon its increased membership, and, we believe, upon its increased usefulness and upon the able manner in which its affairs have been managed during the year, and would feel that the society can do no less than thank all its officers for the parts they have taken.

We would recommend that the secretary and executive board be asked to continue to use their best efforts toward the passing of a bill in our legislature for the suppression of the San José scale, and also that it is due the state that every member use his efforts toward the same cause.

We would recommend that the secretary be instructed to invite the American Pomological Society to hold its next meeting in our state.

In that the impressions of youth largely govern after life, and that impressions of beauty are lasting in their effects, we would recommend that our executive committee be requested to urge on our next legislature a law compelling the setting and maintaining of trees, shrubbery and flowers in every schoolyard in the state.

We would recommend that our secretary be instructed to correspond with the American Pomological Society and all state horticultural societies to the end that suitable national legislation may be obtained to protect all originators of new fruits or flowers.

We believe that as a society we should put ourselves on record as being in hearty accord with the State Agricultural School and the Farmers' Institutes; we believe that they are being judiciously conducted by able and conscientious men and are an honor to the state and an indirect aid to the work of this society.

We think the suggestion of our president that a women's club be formed of our lady members to become members of the Minnesota Federation of Women's Clubs, is good, and for that purpose would recommend that the wives of all members of this society be made members.

Finally we would commend the untiring zeal and the ability put into the work by our secretary.

SECRETARY'S REPORT FOR 1897.

A. W. LATHAM.

The secretary is expected at this time to make a full report of the work of his office, showing what money he has received and expended, the number of enrolled members, in what ways they and the public have been benefited through the channel of his office, and many other things, which, unless the officer who prepares the report embellishes a long array of bare facts with the flowers of a fertile imagination, are likely to make it a tedious and wearisome document. Under these circumstances the only safe course for him is to boil down the facts he would present so they may be taken in at a single gulp and have the dry dose out of the way. The result of the first operation, with your permission, I will now present to you, that you may without delay perform the second.

The fact of first importance that confronts us, then, relates to the strength of our organization, which may be considered from two standpoints, numerical and possessional. In numerical strength we are gratified to record that the year just closing continues to show the usual increase over that of the year before. At the last annual meeting our roll of annual members footed up to 459, while now it numbers 643, which is an increase of 184 members. The following names have been added to our life membership roll the past year: Ditus Day, Farmington; W. S. Dedon, Taylor's Falls; J. Cole Doughty, Lake City; Fred Nussbaumer, St. Paul.

The roll of deceased life members has received an addition also in the name of M. Pearce, much beloved. Others of our well known and equally beloved brothers whose names have been inscribed for the last time on the annual roll are: M. W. Cook, Rochester; W. E. Brimhall, San Diego, Cal.; W. W. Pendergast, Hutchinson; E. J. Cutts, Howard Lake: Wm. Danforth, Red Wing. Portraits and obituary sketches of these, except the latter, have appeared in our monthly, and that of Mr. Danforth may rightfully find a place in an early issue.

It may be interesting to you to have here grouped together the figures representing our membership during the few years past which cover the new departure of our association:

Annual memberships reported in 1890, 123.
Annual memberships reported in 1891, 229.
Annual memberships reported in 1892, 300.
Annual memberships reported in 1893, 378.
Annual memberships reported in 1894, 522.
Annual memberships reported in 1895, 459.
Annual memberships reported in 1896, 462.
Annual memberships reported in 1897, 643.

The total membership for the year closing includes the following:

Annual members	643
Life members	55
Honorary short-time members	9
Total	707

That this is not to be considered final as to the total membership of the year must be apparent when you are informed that the present membership for 1896 is 505, being 43 members more than was reported at the last meeting. A few of our members are a little forgetful and recall their obligations to the society too late to get into the count or to have their names go down to posterity in the roll as published in our bound annual report.

This roll has much significance as indicating very fairly the momentum of our work, and, as it expands and pushes on, more and more come within the range of its beneficent influence. To talk and to listen at our gatherings is not all of the duty of our members; but also by precept and persuasion to add to the number of those who may be directly aided by our labors. That our membership has reached the present gratifying stage is not from any fortunate concurrence of circumstances—for, indeed, these have rather been against us in the past few years of financial stringency—but by reason of the fact that there is such a strong affection for our association and its work on the part of so many of our members and their willingness to do something and sacrifice something for the cause they love. It has been our praiseworthy ambition to see our membership pass the 1,000 mark, and that it could easily be done with your assistance is apparent when you consider that for each one of the present 707 members to secure at least one new one would place the list far beyond that goal. With the inducements offered, especially to such new members, each person can likely name several that in his judgment should and could be brought into the fold with a little personal effort. How many of you will give us a lift the coming year to place our society at the head of the list of American horticultural societies?

As to our possessions, there is far too much that could be said to keep this document within the limits of a single gulp, which I have set myself to do; indeed, I fear it is already too vast a swallow for any good, well bred horticulturist, though not yet beyond the limits of many Minnesota citizens—not members of our society—who take in greedily the hook baited with a "model orchard" or a "budded apple tree."

Our possessions are both tangible and intangible. Of these, the latter are, in my judgment, by far the more important. I need not take time to recite them, as they are well known to you all, but without the love for our work and for each other that has grown with our growth, the memories of our pleasant associations, many of them hallowed and made tender by the recollection of those of our members who will meet with us no more, our society would lack sadly the elements that bind us together in such fraternal and forceful accord. Before this greater share of our possessions the tangible dwindles palpably, and yet these latter are the very necessary tokens and reminders of the former.

The twenty-five printed annual reports of our society are the records of our efforts and purposes and breathe of our ambitions and hopes during the nearly one-third century of its existence.

Another tangible possession in which we have an honest pride is the medal awarded our society by the American Pomological Society, in 1893, for a display of fruit at their biennial meeting—one of only four awarded. Our other possessions of a similar character so far belong to the intangible class, except as to the record appearing in our printed reports, as neither the New Orleans' Exposition nor the World's Fair rounded out its work by distributing the medals awarded, though it is not impossible it may be done in the coming century when a sufficient amount of red tape has finally been rolled off.

The volumes on our library shelves are a strictly tangible and a steadily growing quantity. They now number, aside from our own reports, 617, of which 59 have been received the past year. Besides these there is a large quantity of horticultural periodicals, experiment station and government reports steadily accumulating, enough being now on hand to add nearly another hundred volumes to our library.

As to that other very useful possession, the financial, the treasurer will more properly speak. Of the funds coming into the secretary's hands in the form of membership fees and for advertising in our magazine, etc., I submit the following report:

RECEIPTS FOR 1897.

Annual members for 1898	$69.00
Annual members for 1897	573.00
Annual members for 1896	42.00
"Amateur Fruit Growing" sold	10.35
"Vegetable Gardening" sold	12.50
M. & St. L. transportation sold	8.75
Life membership fees	35.00
Advertising in magazine	142 87
Total	$893.47
Order on treasurer	528.76
	$1,422.23

EXPENDITURES.

Postage	$125.76
Express	80.43
Directing and mailing magazine	16.80
Discounts on memberships to local societies, etc	93.75
Engravings for magazine	40.60
Reporting meetings	103.00
Office rent	144.00
Printing	98 08
Assistance in office	21.45
Expenses, fruit exploring committee	8 68
Plans for horticultural hall	10.00
"Amateur Fruit Growing"	24.90
"Vegetable Growing"	7.00
Insurance on library	5.60
Design for life member's certificate	5.00
Treasurer's salary and expenses	27.20
Office fixtures and expenses	13.74
Premiums, 1895—overlooked	3.00
Sundry expenses, annual meeting, 1896	25.25
Expenses, delegates	21.50
Expenses, annual meeting, 1897	10.14
Sundries	6.10
Total	$891.98
Balance on hand	530.25
	$1,422.23

That the work of the secretary's office is steadily increasing with the growth of the society must be apparent. Some hint of the character and extent of this can be gathered by consulting the figures of the foregoing financial report. The charge for postage alone, amounting to $125.76, represents, after deducting $24.00 for magazine postage, almost entirely the letter and circular postage of this office, since very few reports sent out by the society go by mail, as the express companies handle them at two cents less per volume. The express charges are nearly all for reports, one of which goes to each member and a large number to exchanges. With 700 names on the roll, every day brings correspondence from a number who have business with the society.

The work of the first part of the year was largely increased on account of the efforts put forth to secure what was thought to be necessary protective legislation. While we failed in this, we acquired a vast deal of experience, of which one can always make good use in unlimited amount. It is generally known to you that the legislature passed a new printing law this last session which, on account of the small appropriation accompanying it, proved a source of much embarrassment to the State Printing Commission and threatened for a time to interfere altogether with our publications. But through the courtesy of the public printers arrangements have been made for tiding us over until the session of the next legislature. That there is only the kindest feelings towards our association on the part of the legislative body is fully apparent, and we may rightfully expect that our legitimate wants will be fully cared for.

The work of the office for the coming year, then, will be similar in its character to that of the past year, and the reports and magazines will be sent to the members as usual.

I desire to call your attention to a change in the list of premiums offered to new members, which will be found on the inside page of the front cover of the magazine. There are now seventeen premiums from which to select instead of ten. New premiums are also offered as inducements to our membership to secure new members, to which your attention has already been called in the card circular sent to our members with the program. A repetition of this offer will appear in a little folder, which we make a practice of sending out for distribution by our members.

Members and friends of the society are always welcome in the library and secretary's office, and we hope that you will take opportunity when in the city to see for yourself how the business of the society is being conducted.

TREASURER'S ANNUAL REPORT.

A. H. BRACKETT, TREAS.

1896.	RECEIPTS.		
Dec. 4	To amount brought forward from last years audited statement, balance	$567.29	
" 24	Received from A. W. L. receipts of Secretary's office, from June 19, 1896, to December 1, 1896	212.20	
1897.			
Mch. 4	Received from State Treasurer	750 00	
Aug. 2	Received from State Treasurer	750.00	
			$2,279.49
1896.	EXPENDITURES.		
Dec. 3	Order No. 32, A. H. Brackett	$12.50	
" 3	Premiums at Annual Winter Meeting	117.50	
" 7	Order No. 29, A. W. Latham, fourth quarter's salary	200.00	
" 10	" 31-38, J. M. Underwood, Pres. salary and exp	31.29	
" 10	" 33, Dewain Cook, exp. Supt. Trial Station	5.68	
" 10	" 35, J. P. Andrews, exp. Executive Board	5.00	
" 10	" 36, Clarence Wedge, exp. Executive Board	4.32	
" 10	" 37, J. S. Harris, exp. Ex. Board and Fruit Com	25.50	
" 10	" 40, A. W. Latham, fifty-four Railroad tickets	30 24	
" 10	" 41, L. R. Moyer, exp. Executive Board	5.35	
" 10	" 42, S. D. Richardson, exp. Vice-President	4.66	
" 16	" 34, E. A. Cuzner, salary and exp. Ass't Librarian	11.00	
" 24	" 30, A. W. Latham, expenses Secretary's office	198.85	
1897.			
Feb. 24	" 44, A. W. Latham, half of quarter's salary	100.00	
" 26	" 43, S. B. Green, exp. as delegate to Wisconsin	20.00	
Mch. 10	" 45, A. W. Latham, half of quarter's salary	100.00	
May 29	" 46, " " quarter's salary	200.00	
June 24	Premiums at Summer Meeting	23.75	
Aug. 2	Order No. 49, A. W. Latham, exp. Secretarys office	528.76	
" 5	" 47, J. C. Doughty, exp as delegate to Illinois	23.65	
" 10	" 48, Otto Lugger, expenses as delegate to Wash	25.00	
Sept. 2	" 50, A. W. Latham, quarter's salary	200.00	
" 10	" 51, J. S. Harris, expenses Executive Board	10.75	
" 20	" 52, L. R. Moyer, expenses Executive Board	12.03	
Dec. 1	" 53, A. W. Latham, fourth quarter's salary	200.00	
" 1	" 54, " " President's salary 1897	25.00	
" 1	Balance on hand	158.66	
			$2,279.49

REPORT OF EXECUTIVE BOARD.

WYMAN ELLIOT, CHAIRMAN.

During the past year our society has maintained a very prosperous condition, and your executive board desire to extend thanks to its members for their hearty co-operation and support in trying to advance the interests of horticulture in our state.

While our endeavors have not at all times been as successful in projecting new and progressive plans for the future as we could wish, a retrospective view of the year's business transacted shows that we have made effective and creditable progress in many ways for usefulness along educational lines in our chosen vocations.

Through the efforts and foresight of our very efficient secretary in forecasting the business of the society, he has very materially lightened the labors of the executive board and made it possible to so arrange the board meetings that the business needing our attention could be transacted at times when we have had our annual, summer and state fair meetings, thereby very much lessening the expenses of the board. It will be observed by referring to the program of this meeting that a new plan has been adopted for assigning special topics at the beginning of the year; that those who are to prepare papers for the next annual meeting will have ample time to make observations and come prepared to give us the meat in the cocoanut on every topic assigned.

When we compare the exhibitions made by the members of our society the past year with some of the feeble efforts of previous years, we have great need to congratulate those who have made it possible to place on exhibition so many and such well grown products of the orchard, vineyard and garden. In these exhibitions are exemplified the fruits of intelligent, industrious, painstaking, persistent effort in overcoming the unfavorable conditions with which they are surrounded.

REPORT OF THE LEGISLATIVE COMMITTEE.

WYMAN ELLIOT, CHAIRMAN.

Your committee have expended more time and thoughtful energy the past winter on legislative work than for several years, and have gained but little except experience and some useful information, which we hope can be utilized to good advantage in the near future in the interest of our society. While we have not immortalized ourselves as being expert lobbyists, we have placed on record the state horticultural society as advocating some useful restrictive legislation preventative of the introduction, into our state, of the dreaded San José scale, by the importation of nursery stock infested with it. This met with very sharp opposition from outside nurserymen and tree salesmen, as well as from some of our own home nurserymen who purchase their stock anywhere and everywhere, healthy or unhealthy, wherever they can procure it the cheapest, and by some of our own (we think misguided) members. The first had a very large ax to grind, while in the latter case their opposition was mainly, we

hope, through ignorance of the persistency of the noxious insect we were combating.

The members of your committee were very solicitous in interviewing legislators and judiciary committees in the interest of this restrictive measure, but our efforts to have a suitable law passed governing the sale and inspection of nursery stock from outside, and that grown in the state, were defeated.

At that time we were certain we were advocating a wise and just measure in seeking legislation upon this important subject. The developments the past season have proved that we had well founded apprehensions and had not misjudged the persistency of this much dreaded foe to the interests of horticulture. If reports are true we have already several places within the state where the San José scale has been found, and unless some drastic restrictive measures are adopted every nursery and garden growing trees will be infested.

ANNUAL MEETING, DEC. 7 TO 11, 1897.

F. H. NUTTER, MINNEAPOLIS.

The thirty-first annual meeting of the Minnesota State Horticultural Society was held, according to announcement, in the offices of the county commissioners at the court house in Minneapolis, and the society can but acknowledge with thanks the courtesy that has allowed them the use of rooms so well adapted to their needs. The attendance was excellent and several times tested the capacity of the hall. About one-fourth more railroad certificates were received than the year before. Much interest was shown in the proceedings, though it was with feelings of sadness that regular attendants noted the absence of familiar faces, some of which it is to be hoped will soon reappear, others never again to be met with in our circle.

Notwithstanding the general shortness of this year's apple crop, the fruit exhibit was in most respects superior to that of the previous year, there being about 800 plates of apples shown, besides several plates of fine plums, and one exhibit of some twenty plates of grapes in excellent condition. An exhibit of plums and crab apples by Thomas Frankand, of Stonewall, Manitoba, accompanied by the photograph of this enthusiastic experimenter, attracted merited attention, and the seeds from the fruit were eagerly sought for by our growers. Some general idea may be gathered from the list of awards of premiums which follows.

The effect of subdividing the subjects to be considered and requesting that the papers thereon be restricted to five minutes, was seen in the promptness with which they were presented, and the fact that nearly every session closed with the program completed; neither did the general interest of the audience in the papers seem to flag.

The reports of the various officers and committees showed the society to be in a prosperous condition and its work progressing satisfactorily, and the re-election of all the old officers, except that of treasurer—the retiring tenant of that office being en route for Alaska—without opposition, except in a single instance, indicated

that the society had the fullest confidence in those who had so faithfully served them in the past. At the election many new faces were seen, and it is to be hoped that among them were some whose interest in the real purposes and prosperity of the society will not have ceased with the session they then attended.

GEO. H. VAN HOUTEN, LENOX, IA.,
Secretary Iowa State Horticultural Society.

The program of the meeting has already appeared in these pages, and fuller reports will follow, but it will not be amiss to record the pleasure which was afforded those who attended the evening session on Thursday and listened to the words and music contributed by guests from the State Agricultural School, as arranged by Prof. S. B. Green, and afterwards, both by eye and ear, learned of the work of the year as presented by that genial professor.

Probably the pleasantest incident of the session was the presentation to the society, with a few appropriate remarks by Oliver Gibbs,

Jr., and fitting responses, of a life-size portrait from which looked down upon us the genial face of "Father Harris," a charter member of our society, and one who never fails to be with us and speak words of encouragement; and also, in a still larger picture, a group of a few of our pioneers. These appropriate pictures will hereafter adorn the offices of the society and cheer and inspire our honorable secretary in his fraternal service. The details of this happy event are recited elsewhere in this issue.

We were not forgotten on this occasion by our sister states. Illinois sent us Mr. Arthur Bryant, of Princeton, and Iowa, Mr. M. J. Wragg, of Waukee, both well known nurserymen and officers in their respective associations. Their words of practical wisdom found with us ready response. From the Iowa State Society came also their talented and versatile secretary, Geo. H. Van Houten, whose presence was at once an encouragement and an inspiration. Nor do we forget the wholesome counsels of W. A. Burnap, of Clear Lake, Iowa, representing that sister organization which holds such close brotherly relations to us, the Northeastern Iowa Horticultural Society. Last, but not least, in this list is the delegate from Wisconsin, Prof. E. S. Goff, of the Wisconsin Agricultural College. He was with us but a single day, but we were glad he came, and we improved the opportunity. Prof. Groff, as you know, is the horticulturist of the Wisconsin school, and has made many valuable contributions to our store of experimental and practical knowledge in this line. Our readers will be pleased to recognize his countenance in connection with this article.

PROF. E. S. GOFF, MADISON, WIS., Horticulturist, Wis. Agricultural College.

The new plan of omitting the evening sessions proved to be a success, and the further change which brought our visiting membership all together at one pleasant family hotel, was especially conducive to the growth of fraternal spirit, and kept discussions originating in the meeting at white heat during the intermissions as well, until the close of the session brought the inevitable sundering of friends zealous in a common work.

AWARD OF PREMIUMS.

At the Annual Meeting 1897, of the Minnesota State Horticultural Society.

APPLES.

Article.	Exhibitor.	Premium.	Amt.
Peerless	Gust Johnson	Second	$0.50
Duchess	"	Second	.50
Duchess	J. W. Murray	First	.75
Transcendent	"	First	.75
Whitney	"	Second	.50
Briar Sweet	"	First	.75
Collection	Wm. Somerville	First	3.00
White Pigeon	"	First	.75
Anisim	"	First	.75
Giant Swaar	"	First	.75
Brett	"	First	.75
Rollin's Pippin	"	First	.75
Rollin's Prolific	"	Second	.50
Patten	"	Second	.50
Wolf River	"	First	.75
Gilbert	"	First	.75
Okabena	"	Second	.50
Seedling not kept in cold storage	H. H. Pond	First	4.00
Haas	D. F. Akin	Second	.50
Minnesota	"	Second	.50
Yellow Transparent	"	First	.75
Gideon's No. 6	Wm. Somerville	Second	.50
Collection	J. R. Cummins	Third	3.00
Borovinka	"	Second	.50
Utter	"	First	.75
Yellow Transparent	"	Second	.50
Florence	"	First	.75
Hyslop	"	First	.75
Beecher's Sweet	"	First	.75
Seedling not kept in cold storage	"	Second	2.00
Repka Malenka	Wm. Somerville	Second	.50
Antinovka	W. L. Parker	First	.75
Ostrekoff	"	Second	.50
Rollin's Prolific	"	First	.75
Hibernal	"	Second	.50
Cross	"	First	.75
Longfield	"	Second	.50
Charlamoff	"	Second	.50
Fameuse	"	Second	.50
Okabena	"	First	.75
Patten	"	First	.75
Borovinka	"	First	.75
McMahon	"	Second	.50
Wealthy	"	Second	.50
Anisim	"	Second	.50
Christmas	"	First	.75
Collection	"	Second	5.00
Seedling kept in cold storage	"	First	2.00
Minnesota	"	First	.75
Whitney	"	First	.75
Gideon's No. 6	"	First	.75
Briar Sweet	"	Second	.50
Martha	"	First	.75
Florence	"	Second	.50
Virginia	"	First	.75
Transcendent	"	Second	.50

Article.	Exhibitor.	Premium.	Amt.
Fameuse	Ditus Day	First	.75
Talman Sweet	"	First	.75
Malinda	"	First	.75
Haas	"	First	.75
Hyslop	J. A. Howard	Second	.50
Wealthy	"	First	.75
Seedling kept in cold storage	"	Second	1.00
Charlamoff	Clarence Wedge	First	.75
Antinovka	"	Second	.50
McMahon	"	First	.75
Ostrekoff	"	First	.75
Hibernal	"	First	.75
Malinda	"	Second	.50
Longfield	"	First	.75
Repka Malenka	"	First	.75
Peerless	"	First	.75
Patten	"	Second	.50
Martha	"	Second	.50

SAM'L B. GREEN, Com.

GRAPES.

Delaware	Gust Johnson	First	.75
Pocklington	"	First	.75
Concord	"	First	.75
Worden	"	Second	.50
Brighton	"	First	.75
Lindley	"	First	.75
Wyoming Red	"	Second	.50
Moore's Early	"	First	.75
Agawam	"	Second	.50
Niagara	"	Second	.50
Collection	"	First	3.00

R. A. WRIGHT, Com.

FLOWERS.

Collection Plants	E. Nagel	First	5.00
Geranium in bloom	"	First	1.00
Begonia in bloom	"	First	1.00
Carnation in bloom	"	First	1.00
Cut Roses	"	First	2.00
Cut Carnations	"	First	2.00
Table Bouquet	"	First	2.00
Basket of Flowers	"	First	2.00

JENNIE STAGER, Com.

HONEY.

Extracted	J. W. Murray	Second	2.00
Extracted	F. Moeser	First	3.00
Comb	"	First	5.00
Comb	F. W. Urie	Second	3.00

E. R. POND, Com.

AMMONIA FOR HOUSE PLANTS.—Every housekeeper has her bottle of "Household Ammonia" or some preparation of ammonia beside her kitchen sink or in the bathroom. It is very useful in many ways, as the housekeeper knows. It has also another use. Fill a teacup with tepid water in the morning and add to it three drops of household ammonia. Pour this on the soil of a geranium or other rapid-growing plant in your window. An application of this kind once or twice a week will add wonderfully to the growth and appearance of the plant. It is, in fact, a concentrated liquid fertilizer that is effective, cheap and handy. For a number of plants, twelve or fifteen drops to a quart of water is sufficient. Twice a week on a sunny morning is enough.

PRESENTATION OF PHOTOGRAPHS

of J. S. Harris

and a Group of "Veterans of Minnesota Horticulture."

[See frontispiece.]

The closing feature of an eventful day, Thursday, Dec. 9th, in the program of the late annual meeting, was the presentation to the society of a life size photograph of our "oldest member," J. S. Harris, of La Crescent, and a still larger picture of a group of ten of the older members of the society, whose names appear below. The presentation address was made by Ex-Sec'y Oliver Gibbs, Jr., in the following well chosen words:

Mr. President:--A few of the members of this society have come together recently at a photographer's room and had their pictures taken in a group, and have commissioned me to present the first copy to the society and to ask that it may be preserved by the librarian and hung upon the walls of our assembly room, in the near or distant future, when we shall come to have a hall of our own, and where they may forever look down upon the society's meetings, as the historic forty centuries looked down on Napoleon's army from the pyramids—not, however, with the stony stare of the Sphynx, with its insolvable riddle, upon men warring against men, but pleasantly, with looks of encouragement to their successors still meeting as we are meeting now to help each other and all others in the practice of horticulture or in the enjoyment of the fruits of it.

All good people, and all who are trying to be as good as the conditions of life seem to admit of, wish to be kindly remembered after they shall have walked the way of nature. This is one of the motives in bequeathing our portraits to our families and friends and to the public, and is what has inspired this group which I am about to present here.

I present this picture with the hope that other groups will follow it, for no one group can be complete in itself or completely characteristic of the society.

The persons in this group are old-time members of the society; all, I think, reaching back in their affiliation beyond the '80's, and most of them to the '60's, into charter membership, and yet as you see them nearly all here today they are men still in the prime of life, the united ages of the ten being 731 years, an average of only a little rising 73 years, still workers in the garden and orchard, and workers here, and still calling themselves "the boys." Long may they, and all like them, continue to work and enjoy life, and when they and ourselves go hence, may we go where there is still good work to do, feeling as we go—or saying:

"O Time, thy steady onward sweep
We own at last is best:
It brings us life-renewing sleep,
Or dreamless, endless rest."

Appended here are the names, nativity and birthdays of the members of the group.

	Nativity.	Birthday.
Ditus Day	Massachusetts.	Oct. 10, 1817
John C. Kramer	Germany.	Sept. 17, 1818
J. T. Grimes	Virginia.	May 10, 1818
William Mackintosh	Massachusetts.	Mch. 19, 1819
Col J. H. Stevens	Vermont.	Jan. 13, 1820
E. H. S. Dartt	Vermont.	Nov. 24, 1824
O. M. Lord	New York.	Apr. 20, 1826
John S. Harris	Ohio.	Aug. 17, 1826
Wyman Elliot	Maine.	May 19, 1834
Seth H. Kenney	Massachusetts.	Feb. 22, 1836

The veterans of horticulture in our society are sailing into the sunset. Few of those of the period of organization remain; but every one has maintained a recruiting station, keeping the ranks full. There is no one among them who in his good-bye to the survivors feels any jealousy of the younger element taking his place; but cheerfully, gladly, bids it God-speed, as he goes to his rest. And I may, perhaps, with propriety add here, that one of the compensations of a life devoted to horticulture is that age and what we call death we do not have to submit to, but merely experience it complacently as we do any other orderly process of nature, of which we are thankful that we are conscious atoms in the beneficent whole.

And now, Mr. President, in behalf of a few friends of John S. Harris, I present his picture to the society, a larger one, in a frame by itself, to signalize a remarkable record as a member in which he stands alone. As one of the charter members we all know him; but among them his record is that of continuous membership from the first meeting at Rochester, on October 4th, 1866, till now, a period of thirty-one years without the lapse of a single year, and he is the only member who has this record. Over my spectacles now I see him, on a front seat, as usual,—his perennial florid head and introspective blue eyes, note book and pencil in hand, ready as ever to state his experience or to record ours,—and long may we continue to see him in that position. This is not the time to sum up the work of Mr. Harris and give him his due on the record. He will have it when his time comes, and we are in no hurry to be called upon to pay that debt, but are over-anxious to renew the paper and raise the rate of interest. Still I will say this of Mr. Harris: he has been from first to last the most industrious worker in all the fields of horticultural research we have had, and always in the front ranks as a grower and exhibitor of our products; and in the preparation of papers for our meetings he has been distinguished for his carefulness and accuracy as well as for his industry and willingness to work. As a guide and mentor to us and to beginners who have heard him at meetings or read his papers, his services have been invaluable. As a pioneer in new fields or new methods, others may have excelled him in special lines, but I think I may say this of him with unanimous acceptance, that for thorough working of the whole field of horticultural practice in the transactions of this society, Mr. Harris has not, and never had, a peer among us. A comfort and an

inspiration will his picture be looking down from our walls upon our assemblies for all time.

Mr. Harris, you know this to be so, and this knowledge is your well earned reward.

Mrs. A. A. Kennedy: I think it is no more than justice to tell what good we know of our members before they die, and not wait until after they die when it will do them no good. (Applause.)

The following fitting rhymes were then recited by their author:

M. V. H.—MINNESOTA VETERANS OF HORTICULTURE.

MISS EMMA V. WHITE, MINNEAPOLIS.

In modern times there's come to be
A magic sound of letters three,
Throughout our land, from near, from far,
'Tis known and loved—the G. A. R.
All honor to these war-scarred men
Who on battle field or in prison pen,
Their country loyal service gave
And bravely fought its flag to save.

Still other symbols oft we quote,
So oft they're heard we know by rote;
There's the I. O. O. F. and the K. of P.,
The A. O. U. and F. F. V.,
And scores of others widely known,
Due honor to them all be shown.

But here today on the sea of fame,
We boldly launch another name—
The M. V. H., an order new,
Whose membership did long pursue
In Minnesota's northern wild,
Dame Nature's ever fickle child—
Pomona fair, a winsom daughter.
The contest long and tedious proved,
But ever true to her they loved,
At last they won the race and caught her.

And so in glad assemblage here
This veteran order of fruitmen dear—
The M. V. H.—we now present.
Let one and all, from president
To latest member, homage pay
To valiant men who blazed the way
Through adverse clime and critic's sneer,
And proved that fruits could flourish here.
All honor then, and many years,
To these horticultural pioneers!

'Twould please to mention each by name,
Recount his deeds, exploit his fame,
But Rip Van Winkle's sleep was brief
To that in which you'd seek relief
Should I attempt to here relate
How each attained his envious state.
But fain would I your patience seek
Just long enough of some to speak.

There's Wyman Elliot—city "dad"—
From earliest days he had one fad,
And through busy life's unending strains
To horticulture true remains.

And Kramer, worthy German friend,
With ever a ready hand to lend;
We've missed for long from its fitting place,
The kindly smile of his genial face,
But now it 'll be a regular fixture,
Secure and fast in the Veteran's Picture.

Like Cupid, famed in mystic lore,
Whose arrows wounded many a score,
We too possess a famous "Dartt,"
But ours is skilled in the fruitman's art.
Of latest hobby will he tell—
For talking he can do right well;
'Tis how he girdles apple trees
To make them bear before they please.

In ancient times a famous apple
Did cause the Greeks with Troy to grapple;
'Twas through the award of the hero Paris—
But far more famed our age-scarred Harris.
No deadly conflict in his wake,
But peace and joy his apples make.

And Grimes, that good old man, they say,
Long since from earth did pass away;
But sure some sad mistake's been made,
Nor yet upon the shelf he's laid;
An object still he has in life—
To conquest make of the Elder's wife.

From Morristown, not far away,
Seth Kenny comes with genial ray;
No dullness is nor time inane
With one who always raises "cane."

No kingdom's prouder of its "Lord"
Than we of ours; with strongest cord
Our ties fraternal fast are bound.
If we'd his wealth of honor sound,
No matter to what depths we'd come,
The line most surely would be plum(b).

The moon hath its night, the sun its day,
Which move unchanging on their way;
No less our "Day" has steadfast proved,
Nor e'er from right has he been moved.

Some men alone are famed, as you well know,
Because they husbands are to Mrs. So and So;
But we've a veteran member here
Whose future fame will yet appear
By virtue of an illustrious son.
Full glad he'll be of honors won
When time shall make him proud possessor
Of Mackintosh, the young professor.

The group would never be complete,
Unless it held in honored seat
That first and foremost pioneer,
Who held the fort full many a year;
In mundane sphere or land supernal
We'll ne'er forget the gallant Colonel.

And so their praises loud we'd sing,
And tribute warm of honor bring
To these our horticultural pioneers,
And wish them many happy years.

The President: Respected presentor and venerable friends, who have seen fit on this occasion to do so graceful an act as to present this souvenir to the members of this society.—On behalf of the society I thank you, and I wish I could add to what has already been said, but it seems to me it would be out of place to attempt at this time to make any further remarks, because the subject has already been presented in a more graceful manner by those who have preceded me, and yet, lest there might linger some shade of sadness among us as we think of the members who are steadily growing away from us, I think I had better at this time relieve the strain by singing a little song, not about "Uncle John," but about "Uncle Joe."

President Underwood then entertained the audiance with a song entitled "Uncle Joe," very much in harmony with the occasion.

Mr. J. S. Harris: I am too full to speak after what has been said on this occasion,and after seeing my picture placed as it has been; it is more reward than I expected would be given to me. You all know me. I came to Minnesota almost fifty years ago, when there was no fruit except such as grew wild. My father and mother both inherited a love for fruit and flowers. I began setting out trees and grafting when I was only eight or nine years old. My father came home one evening when I was

about eleven years old and read to me from a paper that Ellwanger & Barry had adopted a new method of grafting, called root-grafting, and his son John was out in the orchard the next morning putting the new method into practice, and they made fine grafts and made a good growth. Probably I was the first man west of New York to graft by that method. I came to Minnesota and I saw there was a great opportunity.

I made up my mind that instead of seeking political honors I would follow something that would be of more benefit to myself and my fellow men. I believed we had the soil and climate that would make the best home on earth for civilized man, and from that time to the present I have put in what little energy I had to bring this thing about.

If I have done any good I am glad of it. I do feel from what has been said and done the last few minutes that perhaps I have done some good. I was present at the birth of this society, and I regret very much that one man could not have lived long enough to have his picture in that group. That is Col. D. A. Robertson of St. Paul; I am sorry he is not in that picture. Another man I would like to see in the picture is Mr. Somerville. They were present at the birth of this society. We were some of the leading figures in the organization of the State Horticultural Society. I had some correspondence with Col. Robertson, but had never seen him. He came in one day, slapped me on the shoulder and asked, "Where is Mr. Harris?" I told him I was the man. He asked me, "What do you say to organizing a fruit growers association?" I told him I had been thinking of the same thing for two or three years, and we immediately set ourselves to work, and we held a meeting on the fourth day of October. We managed by a good deal of talk and persuasion to get twelve of us fellows together, and you can see today that the seed that was sown then has grown. It has not only grown in influence and membership, but above all other things it has been the means of beautifying thousands of homes all through the state, it has made our state one of the most famous throughout the union; and the satisfaction of being present at the birth of an organization which has accomplished what this one has and is known and spoken of throughout the country as this one is, is glory and reward enough for one man. I have hoped to live and be with you to see one other of my ideas carried out. I have always had an anxiety to see the State Horticultural Society have a home of its own. I want to see it have a hall sufficiently large to accommodate the

largest audience that may come out to its meetings, a large and beautiful building and other things to correspond, and before I leave I hope to see such a thing accomplished. (Applause.)

Mr. Geo. H. Van Houten, (Iowa): The time has come when I must leave you, and it may be the last time I may ever be able to meet with you. I came among you a comparative stranger; I had met several of your members before, and I had formed a very favorable impression of you. Duty demands my presence elsewhere, and in saying to you a word of good bye, I want to give you a single thought or suggestion that came to my mind. It has been my privilege to look over the battlefields of Napoleon Bonaparte; it has been my privilege to meditate and study upon the life of that man, by some thought great, but not so by me; and it has been my privilege to study the lives of other great men, and the thought came to me just now that just such men as we see in the pictures before me are the great men of the world. It was Napoleon's ambition to rule the world, and he waded through fields of blood to accomplish his desire, to gratify his ambition. These men have higher ambitions, and their usefulness has been steadily growing, until now you see the broad field which opens out before you; and when the day and year shall come that you shall get to the point where these noble men are standing today, I trust that you can look back with the same satisfaction upon your work as I know they are looking back upon the work they have accomplished. (Applause).

Mr. C. L. Smith: I was one of the twelve who met in that little office and helped to organize the Minnesota State Horti cultural Society. Sickness and the cares and troubles incident to poverty kept me for many years away from the society, but I was planting trees and flowers during that time on the prairies, and I never lost my interest in horticulture. Some insinuate that I have taken almost too much part in the proceedings of the society during the last dozen or fifteen years, but I thoroughly enjoy the meetings. There is one little scrap of poetry that I like to quote to the young people when I talk to them and try to encourage them to plant trees and flowers and familiarize themselves with horticulture, and when Brother Harris was speaking and when this picture was presented, that little couplet kept coming to my mind. It is from one of Whittier's

poems, and it contains a splendid thought. I think it applies strictly to these last few minutes of our afternoon program:

"Give knaves their gold and fools their power,
Let fortune's bubble rise and fall;
Who plants a tree or trains a flower
Is more than all.

"And he who blesses most is blest;
Man, not Nature, knows the worth
Of him, who dying, leaves an added
Beauty to the earth."

(Applause.)

IOWA STATE HORTICULTURAL SOCIETY, 1897.

REPORT OF DELEGATE, A. K. BUSH, DOVER, MINN.

Twenty-five years ago the reports from fruit growing in Iowa were fully as discouraging as anything we hear from Minnesota; now they are so confident and so encouraged by results gained from experience in growing and marketing their fruits that they do not hesitate in planting very large commercial orchards, their fruits selling for the highest prices in the best markets of this country, with a hope and prospect of reaching foreign markets with their products in the near future.

Our secretary of agriculture, Mr. Wilson, fully understands the possibilities of this great northwest country. His personal knowledge and experience gained in the west assures him that the markets of Europe are anxious to buy the products of our orchards and dairies, paying outside prices on account of superior quality. Let us as individuals turn our best thought and energy to testing the possibilities of our soil and in growing the best products, placing them in market in such excellent condition that they will be beyond ordinary competition, and buyers will come to us, and we shall continue to prosper.

Minnesota can learn many valuable lessons from the experience of Iowa in fruit growing.

Prof. Budd, at the central experiment station, aided by valuable assistants in the twelve sub-experiment stations, has been able to sort out the worthless varieties as they appeared in the state—working together they have been able to secure those things which are best adapted to general planting and profit in the state. They recommend a fruit and tree list for each district, which includes certain named counties, furnishing a very valuable guide for planters in every part of the state—a valuable suggestion to us. Prof. S. B. Green, of our agricultural college, is also doing most excellent work in the state experiment station on the college grounds, in securing promising seedlings and all varieties of fruits, trees and flowers, placing some on trial in his grounds, also with each sub-station in our state, securing to us the best only, which, in time, are recommended for general planting. The value of the

work done at these stations is not generally understood but is becoming more and more apparent as planters visit these grounds and profit by their teachings.

This work could with profit be extended so that plantings under direction of our experiment station should be made on the grounds of all our state institutions, planting shade and ornamental trees, etc. where they were needed, and fruits where they could be cared for by the inmates and attendants. This could also extend to county poor farms, supplying those dependents with the luxuries of fruit, flowers, etc., at scarcely no expense, and also extend the good work of these stations.

In this report I shall not attempt to follow their work in detail or as presented by their program, knowing that their methods of instruction, varieties, etc., etc., might be dangerous or unprofitable for us in Minnesota. I also refrained from offering any of our methods or varieties to them, remembering what a southern man said in our meeting a year ago in connection with insane asylums.

Your delegate was made an honorary member of the Iowa Horticultural Society for one year by a unanimous vote of its members present—also very cordially and royally entertained at the Kirkwood hotel, one of the best in the capital city. The meeting was held in the Capitol, in rooms belonging to the society. I must say I was much impressed with the magnificence and architectural beauty of that building, which covers one and one-half acres of land and cost about $3,000,000, suggestive of the wealth and enterprise of the state.

The address of President Powell came early on the program and contained many valuable and practical suggestions and recommendations, some of which I will note as worthy of our consideration.

He stated that only 1 to 4,000 in the state had their names on the membership rolls of horticultural societies and suggested that a special effort be made to interest the young of both sexes. Instead of offering large premiums to skilled exhibitors, a part of the money should be used as premiums to secure papers and essays on horticultural matters from the young people, some to be read at the state and local meetings; also that special premiums should be offered amateur fruit growers under twenty-one years of age.

He also congratulated the state for its effort in securing a place for its girls in the School of Agriculture. Sec. Wilson said: "The teachers of domestic science are not content to follow a dull routine of household drudgery in their teachings; they are appealing to the scientists and specialists in lines which touch the home life to explain the principles on which home practices should rest and to show them how intelligence, taste and skill can make the home a pleasant place to live in, and how scientific knowledge can enable the home maker to maintain the health and generally promote the physical well being of those committeed to her charge." He also called the attention to the need of a text book on horticultural subjects, to be used in schools and recommended one in preparation by F. E. Pease, formerly of Rochester, Minn., a product of our state.

He also called attention to the need of some horticultural journal and referred to the Minnesota publication as being in advance of them, supplying a means of spreading horticultural knowledge.

Legislation was advised to protect planters from the ravages of the tree agent, San Josè scale and other pests. He also called special attention to the Trans-Mississippi Exposition, to be held at Omaha, during the summer and autumn of 1898, as an opportunity to place on exhibition the products of their orchards and farms. Our state should also take a part in this exhibition. It was my pleasure to make the acquaintance of the secretary, Mr. F. N. Chase, of Cedar Rapids, Iowa, who seems to be the right man in the right place.

The secretary's and treasurer's report followed and showed a total disbursement of about $4,000, with a balance of nearly $2,000 on hand.

State Superintednent Sabin read a very valuable paper on "Horticulture in the Schools," which was full of practical suggestions, plainly showing that the up-to-date farmers were in need of a higher and more practical education, also that horticulture was a study placing its pupils in touch with the great book of nature, the source of all knowledge. He advised the New York state system, which places bulletins from schools of agriculture in county schools, also provides an instructor who should visit and give instruction in all rural schools in a certain district.

The election of officers was a very tame affair compared with our election—forty-four votes being the most cast, while we had about 160 at our last meeting. C. F. Gardner, of Osage, was elected president; Geo. H. Van Houten, of Lenox, secretary for the ensuing year, and all the other officers were re-elected.

A most animated discussion on "our Wealthy" followed. Mr. Haverland of Fort Dodge, who has about 1,000 trees of this variety, said he sold about $2,000 worth of fruit this year, and he claims that to be the most profitable variety to plant in northern Iowa, outselling any other kind in the markets. A paper giving the annual yield and price obtained for ten years from a ten-acre orchard showed the business averaged profitable, yielding a net profit annually of more than $50.00 per acre during the ten years.

Hon. J. G. Berryhill, of Des Moines, presented a very instructive paper on the "Plum." He uses large quantities of manure, making the ground very rich, securing very profitable crops annually. The Desota was not satisfactory with him on account of its over-bearing, making fruit too small to be marketable. The "Hammer" is a very promising new variety, a seedling of the Miner.

Mrs. Virginia Berryhill read a paper on the "Sweet Pea," which was full of valuable hints on producing that beautiful and easily grown flower. As more than 90 per cent of the sweet pea seeds come from California, she advised growers to save seeds, selecting such varieties as best suited them.

There were many other scholarly papers read by growers of large experience which I cannot mention for want of time and space, all of which were of more value to planters in Iowa than Minnesota.

The discussions were interesting and many of them lively, especially so when "hobbies" were approached by "cranks." Minnesota does not control those products.

No premiums were offered this year on fruit exhibits, still the display was very fine, especially on seedlings. Originators of such trees of special and described value, receive large premiums from the society. I had the pleasure of visiting an Iowa coal mine in company with Geo. J. Kellogg, the Wisconsin delegate.

In conclusion, I will refer briefly to the subject of top-working. Iowa is now fruiting many tender, yet choice varieties of apples grafted or budded on such hardy stocks as Virginia, Hibernal, etc. This work is no experiment with them but an assured success, Let us profit by their experience and top-work largely with our half-hardy sorts which are known to be productive of good quality and winter fruit. The southern people all refer to Minnesota fruits and vegetables as being of superior quality and most excellent keepers, and they are in demand by the best trade, especially for winter stock. Minnesota Wealthys placed in cold storage in the south or east will command fancy prices; selling now I am told for about $5.00 a barrel.

Our potatoes of such varieties as "Rival," "Burbank" "Ohio," etc, are quite sure to top any southern market. Why not supply the demand for these our products. You may hear from me again on this subject.

NOTICE—A JOINT MEETING.—Secretary Clarence Wedge, of the Southern Minnesota Horticultural Society, announces that that association will hold a joint meeting with the Fillmore County Horticultural Society at Austin, Minn., Jan. 13th and 14th next. They are looking for a rousing meeting and extend a general invitation to all friends of horticulture in the northwest. A number of prominent horticulturists have given assurance of attendance.

Premiums will be offered as follows: Competition open to *All Minnesota*, with no restriction except that fruit must be grown in Minnesota and by the exhibitor and must not have been kept in cold storage. A plate to consist of 4 specimens.

	First premium.			Second premium.			
Plate Wealthy.....	$2.00.....	6	Loudon or	6	Columbian	raspberry	plants
" Haas.....	2.00. 6		"	6	"	"	"
" Hibernal.....	2.00.....6		"	6	"	"	"
" Malinda.....	2.00.....6		"	6	"	"	"
" { Seedling..... / Apple.. ..... {	2.00 6		"	6	"	"	"

Seedlings must be accompanied with description of tree and must not have been exhibited at a state fair or a state horticultural meeting previous to season of 1896.

Fruit for competition may be sent express prepaid to F.W. Kimball, Austin, and he will make the necessary entries as directed by the sender.

N. B.—All nurserymen and orchardists of the state, *whether officers of any horticultural society or private citizens*, are earnestly invited to *enter* into this competition. If the growers of Freeborn, Mower and Fillmore counties have to take a back seat, they can do so gracefully.

Secretary's Corner.

FOUND AT THE ANNUAL MEETING.—A gold cuff button with the letter "B" on it. Apply to the secretary.

THE IOWA ANNUAL MEETING.—Reports of this meeting, which followed directly after ours, will be found in this number, prepared by A. K. Bush, our delegate.

THE ANNUAL FORESTRY MEETING.—The regular annual gathering of the Minnesota State Forestry Association will convene in Minneapolis the second Tuesday in January, the place of meeting and program to be announced later.

MEMBERSHIP TICKETS FOR 1898.—A handsome lithograph ticket is being prepared for our annual members this year, and will be sent soon to all who have paid their fee for the new year. Are you one of this number? If not, please give it immediate attention.

HAVE YOU RENEWED MEMBERSHIP FOR 1898?—If you are one of those who have not yet renewed membership in this society for the year 1898, please attend to it at once or notify the secretary of your desire to be dropped from the rolls. We are not anxious to drop you, but want you to stay and work with us.

WILL YOU SEND A NEW MEMBER FOR 1898?—Notice on the inside page of the front cover of the magazine the valuable premiums offered to all new members to our society. It should be easy to secure such where these inducements are presented. Take an evening off and talk to your neighbors about the value of our society to them!

ANOTHER HOME HORTICULTURAL JOURNAL.—We learn that our fellow member, Mr. Clarence Wedge, of Albert Lea, is about to enter the field of journalism and launch a miniature monthly, appropriately entitled "Northern Trees and Fruits," in the interest especially of horticulture in this latitude. We wish him the success in this venture we feel sure he merits, and with his experience both as an editor and practical horticulturist shall look for a very "meaty" and useful production. When the prospectus is out, we shall be glad to give this enterprise more extended notice.

GREEN ON FORESTRY.—Not content with the work accomplished in the horticultural field by the two books on fruit and vegetable gardening he has already published, Prof. S. B. Green is now well along in the preparation of a third in the series in the shape of a text book on practical forestry, especially designed for the use of his class in the agricultural college, as indeed, the other two were previously; like them, however, it will be of equal value for general use. Considerable space is devoted to a general treatment of the

subject, followed by a detailed description of the trees of the state, each of which is very fully described and illustrated with original sketches showing wood, leaves, flowers and fruit, etc. in various stages. We await with interest the advent of this new work in our field.

OUR ANNUAL REPORT FOR 1897.—This is a very handsome volume of 531 pages bound in black cloth and well worth twice the annual fee, not to mention the magazine for the current year each member receives also. These reports are about ready for distribution and will be sent post paid to all members at an early day. If you have not renewed your membership, do so at once and receive one of these valuable books for your library.

SEX OF A HORTICULTURAL SOCIETY.—If any of our readers should notice the amusing blunder on page 25 of this number which leaves the sex of an association like our own somewhat in doubt, it need not necessarily be laid to the charge of the writer of the article, Mr. F. H. Nutter. He may console himself with the reflection that the secretary has the last chance at it, and in a moment of mental aberration must have got himself badly twisted. In the meantime what is the sex of the institution anyway?

PREMIUMS FOR SECURING NEW MEMBERS. — Valuable premiums are offered to you for securing new members as follows: For one new member, a cloth copy of Prof. S. B. Green's "Amateur Fruit Growing," a young tree of the Hybrid Sand cherry or of the famous Surprise plum, while a limited supply of the last two hold out—first come first served; for two new members, a copy of Prof. Green's new work "Vegetable Gardening," sold at $1.25. Just what every amateur gardener in the northwest should have.

Give us a lift.

OLIVER GIBBS, JR., WITH THE INSTITUTE CORPS.—Our former secretary and long time associate in the horticultural work in the northwest is helping Prof. Gregg out as lecturer on horticultural topics with the farmer's institute during the short ante-holidays tour. He is evidently enjoying this new experience. Of his audiences he writes: "A large proportion of the people who attend are on the alert for information on horticulture, or they are mightily polite to the platform." This short tour includes Brainerd, Little Falls, Sauk Centre and Monticello. Mr. Gibbs goes to Chicago on Christmas eve to visit his children.

THEY OUTDO THE MOTHER SOCIETY.—We are interested to note that the Southern Minnesota Horticultural Society in the announcement of its coming meeting, found elsewhere in this number, are offering much larger premiums for display of plates of apples than the state association, or even the state fair, but this offer is accompanied by the condition that the fruit "shall not have been kept in cold storage." Probably in that part of the state, plenty of specimens can be found of the limited number of varieties noted in good preservation under ordinary conditions. We hope we shall receive a good photograph of this fruit exhibit for the benefit of the readers of our magazine.

WM. DANFORTH, Sr.
Late of Red Wing, Minnesota.
(See opposite page.)

THE MINNESOTA

HORTICULTURIST.

VOL. 26. FEBRUARY, 1898. No. 2.

In Memoriam.

WILLIAM DANFORTH, SR.,

RED WING, MINN.

DIED NOV. 24, 1897, AGED 74 YEARS.

(See frontispiece.)

William Danforth, Sr., was born in West Boscawen, N. H., (now Webster) May 2, 1823. There he remained during his youth, attending school at the neighboring academies. At the age of twenty he commenced railroad work, and during the greater part of his life after this time followed the profession of civil engineer.

In September, 1862, he enlisted in Co. K, 16th Regiment of Vermont Volunteer Infantry, and was discharged with that regiment in August, 1863, serving but eleven months, first as lieutenant, then as captain, and having the experience of Gettysburg as a memory.

He came to Minnesota in July, 1869, being employed by the M. & St P. Ry. Co. on surveys and construction between St. Paul and La Crosse, and continuing in their employ with the exception of a few months on the N. P. Ry. till 1873. From 1880 to 1883 he again worked for the C. M. & St. P. Co.

He served Goodhue county for some years as surveyor, and was also city engineer of Red Wing about eleven years. From 1888 until the time of his death he was Chief Engineer of the D. R. W. & S. R. R.

In 1873 he purchased a place of about sixty acres near Red Wing. Although his duties as engineer took him away from home much of the time during these years, yet he always took a great interest in improving his land, and the cultivation of small fruits was his especial pleasure. He was a very enthusiastic member of the State

Horticultural Society, and none but the most imperative reasons ever keep him away from the meetings, as he felt that they were most instructive and helpful.

His death occurred very suddenly of apoplexy, a slight shock of which he had experienced two years previous.

Mr. Danforth married on April 30, 1857, Miss Lucia A. Nichols. She survives, as do also two children, William, who is at present county surveyor, and Lucia, who is connected with Carleton College, at Northfield.

Mr. Danforth first became connected with this society in 1886, and thereafter his name appeared continuously upon the rolls, and his face soon became a familiar one at our meetings, which he rarely missed. During these years the society has had no stauncher friend than he, nor one who stood more ready to serve its interests at whatever personal loss. Of the spirit of disinterestedness so prevalent in our association and which is the secret of its growth and influence, he partook in a very large degree. Quiet, unostentatious, genial, a man of strict integrity, he had a host of friends in and out of our society, who will most sincerely mourn his death. SEC'Y.

DEATH OF JOHN LITTLE, GRANTON, ONTARIO.

The decease of a noted Canadian horticulturist is announced. Mr. John Little passed away at his home in Granton, Ontario, Canada, on the 17th of November, 1897, aged 82 years. Mr. Little was born in Belfast, Ireland, in 1815, came to Canada about 1843, and engaged in farming. During the last twenty-five years he had been deeply interested in the growing of strawberries, having originated many new seedlings and tested nearly all the new varieties that have come out during the last quarter of a century. The Woolverton and Saunders are among the best of his seedlings so far introduced. He leaves an untarnished reputation for candor and integrity, was greatly esteemed and will be held in honor by all horticulturists of America. J. S. H.

Trial Stations, Dec., 1897.

CENTRAL STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

The School of Agriculture and Experiment Station, although forming different departments of the State University, are so closely identified in the minds of the people, that the course of one cannot be considered complete without some allusion to the other. So I shall preface this report with a brief reference to the condition of the School of Agriculture.

The appropriations made by the legislature at its last session have resulted in the building of a good central plant for heating and electric lighting and of a finely appointed girl's dormitory. This has made it practicable for the girls to be admitted to the School of Agriculture on a footing with the boys and does away with the necessity for such a school for girls as we have maintained for several years past during the late spring and early summer months. This together with the increased attendance of boys has resulted in a larger attendance than we have ever known before at one time and an increase in the School of Agriculture of a number of students during January, 1897, over those attending during January in 1896. This increase in attendance has had to be cared for in classrooms which were already crowded, so that now in some of them the students and instructors are placed at a great inconvenience. Along horticultural lines this has been especially noticeable, so much so, in fact, that a large number of students have necessarily been refused admission to the classes in horticulture. In greenhouse laboratory work, this has resulted in the sifting out of all lower class students who have wanted to attend.

Greenhouse Laboratory Work is a line of instructien which although new, has shown itself popular and beneficial during the past three years it has been in practice. The lessons given consist of the testing of seeds to determine their impurities and germinating powers; root grafting, where grafts are started into growth in the greenhouse, so the students can see the method by which the stock and graft unite; budding roses in the greenhouse; the propagation of greenhouse plants by seed and soft cuttings; and the general care and management of house plants, including potting, watering, temperatures, insects and diseases. In this connection a few of the fundamental principals which lead to the development of cultivated plants are taught and some practical work given in the pollination of plants, using for this purpose Chinese primroses,

petunias and tobacco. This work seems to fit especially well into the course in the School of Agriculture.

Bulletins Issued. The Division of Horticulture has issued two bulletins during the past year, though they really belong to 1896. Bulletin No. 49, on the "Rate of Increase on the Cut-over Timber Lands of Minnesota," is a study of the conditions of our forest lands and the rate of increase on them. The work is merely preliminary, but it has taken up the subject at sufficient length to show that if the fires were kept out of the pine lands of this state the growth on them would soon renew itself. Bulletin No. 52, on "Variety Tests of Potatoes in 1896 and Potato Implements," contains many illustrations and descriptions of special potato machinery.

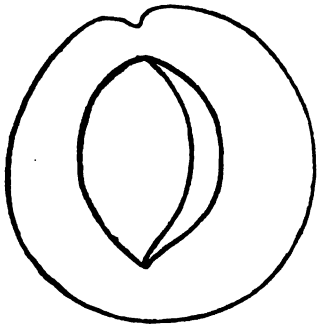
Increase in Equipment. Several hundred photographs have been taken in the Division of Horticulture during the past year, and the collection now numbers about seven hundred. The division now has about five hundred lantern slides for use in connection with lectures on horticulture.

A new system card index for all our orchards and fruit plantations has been started, for, owing to confusion in the nomenclature of our newer varieties of fruits, including those of Russian origin, it was found unsatisfactory to depend entirely upon the name of the fruit under which it was received. In the orchard one number is given to each tree-place, and in the index one numbered card for each tree. In this way it is an easy matter to keep a description of each tree on a card by itself. This I regard as a great improvement on our former system of keeping records. All fruits of the state are also being catalogued on the card index plan, and it is my intention to so arrange them that the variety can be readily detected by its season and color.

Mr. J. S. Harris has kindly donated to the Division of Horticulture a set of fifteen volumes of the Rural New Yorker, which have been bound and placed in the division. A new wagon, set of bobsleds and street watering cart have also been added to the eqipment.

The season of 1897 was here characterized by plenty of rain, so that only once or twice during the entire season was it necessary to use our irrigating plant, and our crops were generally very good. The late spring frosts which did so much damage in other parts of the state did not hurt us very much, although our strawberries would probably have been injured by them had we not covered them with mulch from between the rows on the nights when the frosts occurred.

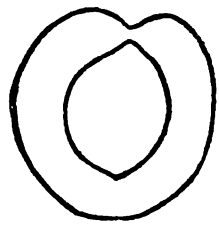
The trees in what has been known as the Russian orchard and in the new orchard are doing well. About seventy varieties of apples have been fruited during the past season, and considering the fact that our location and soil are poorly adapted to the growing of apples the results have been very satisfactory. All varieties of plums produced very heavily, so much so that we picked off more than half the fruit on the Desota soon after it set. The new varieties of plums of special interest which have fruited the past year are the Aitkin, Manitoba No. 1 and Surprise.



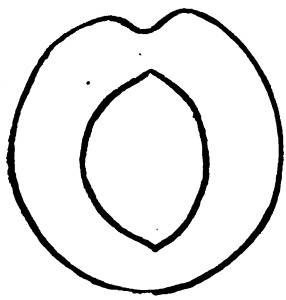
(Figure 1.)

The Aitkin (Fig. 1) is a large, fine looking plum, belonging to what Sargent calls the Prunus nigra. It is of irregular, roundish form, with a very slight suture; bright yellow skin overspread with bright red, thick, tough; short stalk inserted in a very small cavity; firm, sweet flesh of very good, rich quality, but not sprightly; and nearly a freestone, with a large, flat pit. It is the earliest large plum we have, ripening in the middle of August, several days ahead of the Cheney. It is a strong, vigorous grower. The trees were received from the originator, who lives at Nichols, Aitkin Co., Minn. This gives promise of being a very important early variety.

The Manitoba No. 1 Plum (Fig. 2) was received from Thomas Frankland, Stonewell, Manitoba. Fruit small, of fair quality; flesh and skin free from astringency; skin rather thick, red with light bloom; flesh yellow, rather coarse; stem, long and slender. It ripens about the middle of gust at the Experiment Station. The tree is thrifty though rather dwarf in habit.



(Figure 2.)



(Figure 3.)

The Surprise Plum (Fig. 3) has fruited, here for two season. Fruit is large, very solid, ripens about the middle of September, keeps for a long time and promises to be of great value for marketing. The form is round oblong; color, yellowish, overspread with red and light blue bloom; stem, long, slender; cavity, somewhat broad; suture, well defined; skin, thin, tough, without astringency; flesh, firm, not adhering closely to the stone; flavor, peach-like, rich, delicious. The tree is a remarkably strong, healthy grower and is very strong in the crotches, where many of our native plums are weak. On account of its productiveness and solidity, I think it destined to become a very popular market sort.

Raspberries and blackberries fruited well with us. Among those especially worthy of mention is the King raspberry, a new variety sent out by Thompson & Son, Rio Vista, Virginia. It is a very early, strong growing red raspberry of large size and good quality, well adapted to marketing and worthy of trial. It has fruit here for three years.

The *London* is a very remarkable red raspberry and seems surely destined to become a leading sort for home use and the market. It

produces more fruit throughout its bearing season than the King, but not so much early fruit, and more fruit than any other variety grown here, and I note that reports from several other states confirm this.

The plants of the *Royal Church raspberry* are strong and healthy and the fruit is of good quality but too crumbly to be of any value for market. It is good for home use, but I think there is little need for it in this state, as the Turner takes its place in every way.

The *Miller's Red raspberry*, though fairly productive, has not proved itself of sufficient merit here to warrant its cultivation.

The *Russian cherries* have for a number of years made a good, strong growth and have proved to be very hardy trees, but during the past few winters the fruit buds seem to have been injured sufficiently to prevent their opening in the spring. This weakness I am in hopes they will outgrow as the trees get older and make a less vigorous growth.

The *Wragg cherry* has been more productive than the so-called Russian varieties and is the most productive kind we have grown.

The *Buffalo-berry* plants, from seed sown here about four years ago, produced a large amount of fruit this year. The fruit seems to be improved by hanging on the bushes until after hard frosts and in this respect resembles the persimmon; but, as I have before stated, I am convinced that there is little opportunity for making a market for this fruit on a large scale. It is, however, so easily grown that the plants should be sold at a low figure, and then I would be glad to recommend the general planting of a row of one hundred or more feet long as a fruit-bearing windbreak or fence for home gardens. I think it is well adapted to such a place, as it is certainly a very pretty ornamental plant, and the fruit would be found very useful.

We have grown many varieties of *Russian pears*, but as yet have failed to get any of sufficient hardiness to withstand fire-blight. Several large trees which we thought were going to prove hardy were lost from this cause the past year. Gakovska has borne a few inferior fruits and is the only Russian pear we have ever fruited.

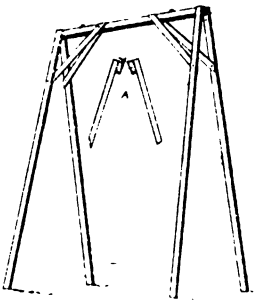
The *Russian mulberry* has fruited very well and even though the fruit is not adapted for market or dessert purposes where better fruits can be obtained it is often regarded as of considerable importance in the prairie sections where other fruits are scarce. In the southern half of this state, I think it may be used to advantage as a windbreak and fruit plant, for it certainly furnishes a supply of fruit for the birds at a season when they would otherwise feed on strawberries and raspberries.

Plum Curculio. The plum curculio was about as troublesome as usual the past year, but by jarring the trees they were prevented from doing serious damage. I regard this method of combating them as far safer and more practicable than spraying with poisons.

Rabbits and Mice. Last year rabbits and mice did considerable damage in our nursery before we knew of their presence. This year they became very abundant and threatened to do serious damage, but the trees were washed with a mixture of cement and skim milk made of about the consistency of common paint, to which was added

one tablespoonful of Paris green to each pailful of paint. This has proved a very effectual remedy.

Plum Aphis. This year the plum tree aphis was very injurious to native varieties of plums all over the country. At the Experiment Station the trees were so badly infested that even the fruit stems were often completely covered with them. They were so abundant that spraying with kerosene emulsion and tobacco water afforded very little relief, as the leaves curled up very nearly and thus protected the insects from these solutions. Under these conditions I resolved to try tobacco smoke. In order to use the smoke most successfully it was necessary to confine it around the tree and after trying various styles of tents the following was found the most practicable (Fig. 4). Our trees spread about sixteen feet in diameter and are about sixteen feet in height. We made two frames, as shown in figure 4, of 2-in. x 3-in. pine. The uprights are sixteen feet long and cross pieces eight feet long. In the cross piece of one frame are two large staples made of one-fourth inch iron and on the cross piece of the other are two pins two inches long corresponding to the staples in the other; so that when the frames were raised the iron pins would go through the staples and the two frames would be keyed together, thus making what was practically a horse eight feet long with legs sixteen feet long and stiff enough to support the weight of a man or the tent cloth. This frame would also shut together, so that by the use of a guy rope it could be set up or moved easily by three men.

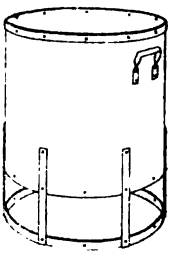


(Figure 4.)

(Figure 5.)

The tent cloth is made in two parts, one part being hooked securely by its upper edge to the upper side of one of the cross pieces of the frame. The other cloth was not put on until the frame was over the tree, as shown in figure 5. It is quite an easy matter for three men to handle the frame with half the tent cloth attached, and we found it the most expeditious to move the tent with this attached whenever the trees were near together. In some places it it might be best to unhook the cloth and set up the frame and then by means of a ladder put on the cloth. We have done this

where there were plants between the rows which interfered with moving the cloth. In putting on the second piece of tent cloth it should lap over about two feet at the top so as to make a tight joint, to hold in the smoke. This piece is drawn over the frame and held in place by two small ropes. Each piece of tent cloth is big enough to reach half way around a tree spreading sixteen feet and the frame and allow a liberal amount for a fold at the ends, where the two pieces are fastened with safety pins. It is not necessary that the frame should cover the whole tree but that it should come up high enough to hold the cloth,so that it may be drawn over the branches. In smoking we used a common greenhouse fumigator, as shown in figure 6, but any iron pail with holes near the bottom will answer the same purpose. It required about five minutes use of the smoker to fill the tent full of smoke, after which the smoke was kept confined for from ten to fifteen minutes before the tent was removed. It took less than ten minutes to move the tent from one tree to the next and to set it up ready for the smoke, or something less than half an hour for each tree for the complete operation. It required at least three men to move the tent to best advantage. While the smoke was being held in the tent,the men in our case found employment at hoeing the small fruits and shrubs between the trees. In case a large number of trees were to be smoked, the use of three tents would keep the men busy all the time, and I think the cost per tree could be reduced to about eight cents. In this case the cost was about twenty cents per tree. In our case also the cloth used was two stock covers, but heavy cotton cloth would answer just as well.


(Fig. 6.)

The frame, the management of the tent cloth and the fumigating can are shown in the illustrations. The material used for smoking was tobacco stems, which we obtained here free of expense from cigar factories. In using the fumigator, or smoker, care must be taken to keep the stems from blazing, or the tree may be injured. On this account,it is well to have the stems slightly moistened. We found that after putting up the tent and filling it so full of smoke that one could not see through it and leaving it for fifteen or twenty minutes, all lice would be killed and fall to the ground, often completely covering the ground under the trees.

ALBERT LEA TRIAL STATION.

CLARENCE WEDGE, SUPT.

APPLES.

The past season has been unusually favorable to the healthy growth of both orchard and nursery, and although an off year for fruit we have gathered about 100 bushels from our home orchard of eighty trees.

Blight leaps over dozens of other varieties in the nursery and descends upon a few short rows of Transcendent crab, situated about the centre of the nursery, and nearly destroys them; the same is true of the Russian Aport and Transparent in the orchard.

The severe freeze near the end of May caused an unusual dropping of apples that had just set. This dropping continued for nearly two weeks, until some kinds, notably the Yellow Sweet, had but a small crop left to mature.

The Charlamoff has done extremely well, and the fruit seems to be particularly relished by those who visit the orchard.

The Cross (413) bears a better and handsomer fruit than we had supposed, and gives strong promise of taking its place upon our standard list.

The Russian Green (one of the Anis family) has entirely cleared itself from any hasty conclusion as a shy bearer. Nothing did better in the orchard this season.

The Antonovka is a superb fruit but very difficult to keep, even in cold storage, as it quickly becomes mealy and cracks open.

The Repka Malenka again ripens its fruit, wood and leaf in safe season, and drops its foliage with the Duchess—a truly remarkable habit in a variety which keeps as well as Ben Davis.

Patten's Greening is a yellow apple and should have its name shortened to Patten. (Since this report was written it has been so shortened by action of the last meeting of this society.) It is strong in the points of early and profitable variety, fine, even size, and smoothness of fruit and freedom from disease.

Peerless is strong in its freedom from blight and quality of fruit, and in the nursery is, like the Whitney, truly a beauty; but is exceptionally weak in its forks and in any indication of hardiness. It comes into bearing about two years later than Patten's Greening.

Girdling to promote bearing was practiced to a limited extent in the orchard.

PLUMS.

A very satisfactory crop was matured upon our grounds.

The following list marks the dates of ripening of most of the varieties fruiting: Manitoba, Aug. 16; Aitkin, Aug. 21; Odegaard, Aug. 21; Compass Cherry, Aug. 23; Cheney, Aug. 29; Knudson's Peach, Aug. 29; Forest Garden, Sept. 1; New Ulm, Sept. 4; Wyant, Sept. 6; Rollingstone, Sept. 9; Wolf, Sept. 13; Blackhawk, Sept. 14; Hawkeye, Sept. 15; Desota, Sept. 18; Miner, Oct. 1.

The Desota is about as satisfactory a variety as any of its season.

The Aitkin is the most valuable addition to our list for many years. It is at least ten days earlier than Forest Garden, and so much superior in quality as not to be mentioned in the same connection. The last excuse for retaining the latter variety has now been removed.

The Compass Cherry, which may be properly regarded as belonging in this list, is all that has ever been claimed for it in hardiness, early bearing and productiveness. It is uninjured by pocket, curculio, gouger or weevil and makes an excellent sauce. It is doubtless worthy of a place until something better of its peculiar class is produced.

The Miner planted as we have it, in the midst of other varieties, is very fruitful indeed and highly esteemed as a very late variety. For culinary use it is particularly appreciated in our family, as its

skin cooks up tender, and the pulp and all is free from any trace of astringency.

We are propagating two selected varieties of the sand cherry.

Trees budded on sand cherry stock have borne two crops of fruit at this station and still show every sign of making durable orchard trees.

We have made many attempts in budding and grafting the sand cherry upon the plum at a distance of seven feet above the ground, but have never succeeded in getting anything but an exceedingly feeble and unsatisfactory growth; when worked at the ground, the union is good and the growth strong.

SMALL FRUITS.

The Older raspberry again stands at the front among blackcaps for vigor, health and fruitfulness.

Ohio stands next and is a firmer berry.

Schaffer is suffering most severely from anthracnose.

Loudon is very promising.

Lovett is our most reliable strawberry, and nothing makes a better appearance on the market. Plant exceedingly free from rust.

Warfield is easily affected by drouth and much subject to rust but bore a fine crop the past season.

Bederwood is a grand variety, a little too soft for market and somewhat subject to rust.

Haverland is not productive enough for market, but worth planting for home use.

Michel's Early has been discarded.

EUREKA TRIAL STATION.

C. W. SAMPSON, SUPT.

Grapes came through the winter in excellent condition, owing to the fall of snow which protected the buds. They bore a light crop, however, as the wood the year before did not ripen well, and the fruit buds were not well formed. This year the wood has ripened in good shape, and we look forward to a large crop of grapes the coming season. The vines had some mildew on account of the wet season and hot, sultry weather. This is easily prevented by spraying two or three times with Bordeaux mixture before the vines commence to mildew.

Our first grapes began to ripen Aug. 25th, and were about all ripe by Sept. 20th.

We planted some of the newer varieties this season, such as the Alice and Campbell's Early, the latter a fine black grape, originated by Geo. W. Campbell, and claimed to be far superior to the Concord. The Early Ohio we have not fruited, but do not think very highly of it from what we can learn. We shall have several new varieties fruiting the coming season and shall watch them with a good deal of interest.

Strawberries came out in fine shape and bore a good average crop. The severe frosts in the spring did not injure them but very little at

my place, it being very near the south shore of Minnetonka. The Bederwood, Lovett and Jessie did the best for me this season.

Currants had an average crop. They were troubled some with the currant worms, but a good application of Paris green soon drove them from the field.

Goosberries were loaded with fruit and were quite free from mildew. The Red Jacket did remarkably well, the fruit being large, of fine flavor and with no signs of mildew.

Red raspberries bore a large crop, and the canes kept healthy throughout the season. The Loudon was the heaviest yielder of some five or six varieties.

EXCELSIOR TRIAL STATION.

H. M. LYMAN, SUPT.

The season started in extremely dry, which was unfavorable for newly planted trees; but plenty of moisture came later and revived them, and they mostly made a good growth. The blight has been rather severe on those varieties which are subject to it. The Charlamoff appears to be among our very hardiest Russian varieties as regards standing cold. It blights some on the limbs, but I have not seen any signs of blight on the body of the trees. With my present knowledge of the tree, I would recommend planting it as largely as I would the Duchess.

I have one tree of Patten's Greening which was set out four years ago. It bore this year one bushel of very smooth, large apples of fair quality, although the apple is not a very long keeper.

The Martha crab is a fine looking tree. I have never seen any blight upon it, although it is among others that blight badly. Thus far it has been a shy bearer. It blossoms out quite full every spring, but carries very little fruit.

I have a Russian variety called Krimskoe (56M). The scions came from Washington in 1872 (I think). I top-worked it on a seedling that spring. The fruit is extremely early and very good. It has shown no signs of blight or winter-killing, while the Duchess that stood around it were killed, root and branch, by the cold of '85. Undoubtedly the hardy seedling stock upon which it was grafted helped to sustain its life through those trying winters. The fruit in quality is very much like Lubz Queen (No. 444), though the tree is much hardier.

LA CRESCENT TRIAL STATION.

J. S. HARRIS, SUPT.

During the season of 1897, the trees and plants at this station made a healthy and satisfactory growth, with the exception of pears and a few varieties of Russian and seedling apples, which have suffered more than usual from blight. The crop of pears amounted to barely enough to capture the premiums offered at the late state fair. Three varieties only fruited, viz: Flemish Beauty, Peffer's Seedling and Bessemianca, and the trees that have fruited are blighted beyond hope of recovery. Trees of the same variety that have not fruited have not blighted so badly. These trees are on

very fertile soil and in sheltered locations. We propose to make one more attempt at growing peare, by planting the trees on thinner soil and a more elevated location. Up to the present data we have planted about 500 pear trees, at a cost of about $200 besides time and labor of cultivation, and have so far realized from them in fruit and premiums about $40, and have left at the present time about a dozen trees that promise to live to produce fruit. As our experience has been about on the line of others who have attempted to grow this fruit, and as our farmers are often importuned by traveling agents of nurseries located far south and east of us to purchase the trees, we deem it best to make this report as a warning against the extensive planting of pear trees until further trial finds us varieties that will endure our climate and some remedy for blight is found.

The crop of apples this season was generally been very light and the quality poor, the Wealthy and Gibb crab doing about the best. Nothing new has fruited that promises to be of great value. Up to the last of August, the soil moisture was sufficient to ensure a fair growth of wood, but since that date the rainfall has been necessarily scant, and the ground is dried out to a great depth. The precipitation for the entire growing season was more than eight inches less than the average, and also less than in most other portions of the state. Trees have ripened their wood well, but if we have a severe winter without rain or snow there is great danger of serious root-killing. Preparations are being made to add about twenty additional varieties to the large list now on trial. The Russian varieties, Arabian, Yellow Calville, Vargulek, Stepka, Sweet Pipka, Saccharine and Skalanka blighted badly again this season.

Grapes were little better than half a crop. This is generally attributed to the hard frost that occurred in May. Black varieties gave a better crop than white and red varieties. The Worden was the best of all, and Moore's Early and Concord next in order. Of light grapes, the Empire State were the poorest, and the Niagara and Delaware but little better.

Strawberries were treated very fully in the midsummer report, page 278 of the Magazine for July. We only remark here that they do not enter the winter this season promising as well as last, and late plants have scarcely any roots.

Blackcap raspberries were considerably injured by frost, the Palmer being nearly a total failure. The Ohio set very full, but the fruit was smaller and of poorer quality than in previous years. The Nemaha and Older were the best. The best fruit was secured on the one crop plan, that is, on beds set the year previous in rows four feet apart, plants two to three feet apart in the row, and thorough cultivation given during the summer. As the canes lie rather close to the ground, thorough mulching must be applied to keep the fruit clean. The plants are destroyed after the crop is all harvested. Only strong, home-grown plants are adapted to this method.

Of the red raspberries, the Marlboro gave the poorest results. The canes were more generally infested with borers than other varieties, and they also suffered more from leaf curl. The fruit was not generally bright and fair and did not take well in the market.

As they were no better with other growers, we do not think them worthy of general cultivation. The Cuthbert does very well, with fruit of finest quality and appearance. The Loudon is fully meeting our expectations. The plants are stocky and healthy. They fruit as well as any other variety we have and continue in fruit several days longer than other varieties. Strong plants set last spring yielded considerable fruit until September. The fruit is large, of fine appearance and the best of all for market. This is the first season that I have fruited the Miller, and in yield it did not come up to our expectations. The fruit is of fine appearance and quality and plants healthy. The Royal Church has done better than heretofore, but we do not recommend it for market purposes because it crumbles in picking unless very ripe. I am not very much taken up with the Columbian and do not consider it any better than the Schaffer for growing in this climate. It needs winter protection, and the bush grows too large on good soil to handle well and does not amount to much on poor soil. The fruit is excellent for canning and home use, but owing to the color does not take very freely in the market until people are educated to its use.

No experiments in spraying of trees and plants were made this season, but arrangements are in progress for making some next season. Aphis have been unusually plentiful on orchard and nursery trees, and we would like to have some remedies against them suggested.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

STRAWBERRIES.

Of twenty varieties, only two produced abundantly, Bederwood and Warfield. The Gardner, Arrow, Western and Mary were medium in vield and fine in quality; Bubach, Crescent, Van Deman, Parker Earle, Capt. Jack, Timbrel, Princeton Chief, Greenville, Michel's Early, Jessie, Princess, Crystal City, Lovett, etc., bore no fruit worthy of mention. The season was favorable to plant growth, and all varieties have a good stand for another year.

Red and black raspberries were a two-thirds crop. New plants set last spring have made a fine, strong growth except Loudon. Blackberries were only one-half a crop, having been injured by frost.

Currants were fair, cherries were very good and grapes failed. Apple trees that did not bear last year did well this year. Plum trees set very full, but much of the fruit dropped before ripening. The fruit though not as large in size as usual was a fair crop.

All trees and plants received from the central station, and from other sources mentioned in the midsummer report, have made a fine growth and go into the winter in good condition.

COMPARATIVE CONDITIONS.

The apple trees have blighted again this year, the younger trees not so much as the older. Cuthbert and Turner raspberries still

stand at the head of the reds. Loudon made poor growth. Palmer for early, and Gregg and Minnehaha for blacks. The Conrath shows no superiority. Schaffer is equal to Columbian in every respect on this soil. Badger and Saunders and Minnesota blackberries need further trial: Ancient Briton, Snyder and Stone's Hardy are giving satisfaction.

The aphis on the plum trees was very destructive to the foliage of young trees and appeared to have a preference for the Stoddard; whether this was accidental or otherwise I am unable to say. Ninety-eight per cent of the black raspberry tips grew this year, in place of twenty-five to forty per cent heretofore, which success I attribute mainly to shallow planting.

MONTEVIDEO TRIAL STATION.

LYCURGUS R. MOYER, SUPT.

Among promising small fruits on trial we may mention: Stewart's Seedling currant, Loudon raspberry, Columbian raspberry, Royal Church raspberry, North Star currant and Long Bunch Holland currant. The Palmer red raspberry can no longer be called an experiment. It appears to be an early cap of the first rank. By reason of its earliness it suffered this year from the late spring frosts and did not produce so full a crop as the Souhegan. The most popular raspberry for use on our own table is the Golden Queen.

The old Charles Downing gooseberry has been suffering from mildew on our grounds. This year we sprayed the bushes with Bordeaux mixture and with arsenical solutions. We succeeded in securing a good crop.

Our Russian cherries are still promising well, but are producing no fruit. The same is true of the Russian pears.

A Russian apple from Prof. Budd, marked Smd. No. 1, produced a few large apples of fairly good quality. Blushed Calville after having borne a large crop last year produced a good crop again this season. The apples are white and have no suggestion of ever having any blush. The fruit matures about two weeks before the Oldenburg and is of good quality. I think this tree will prove to be a decided acquisition to our orchards.

The Wyant plum produced a full crop of excellent fruit. The plums were not large, but the quality was excellent.

Buffalo-berries produced a large crop, but the birds gathered them before we could test their value.

Charles X lilac has begun to bloom with us, and appears to produce larger and better flowers than its parent, Syringa vulgaris.

Another plantation of white ash, Fraxinus Americana, was made last spring for the purpose of comparing its growth with that of our native green ash, Fraxinus lanceolata. Our former planting of white ash failed.

A plantation of Burr Oak acorns made on the open prairie from seed that had been stratified through the winter gave excellent results. There would seem to be no reason why this excellent tree should not be planted on every farm.

Among the shrubs on trial at the station that promise well may be mentioned Pyrus tortingo, which appears to be perfectly hardy; Prunus tomentosa, which bloomed for the first time this year; the European Viburnum lantana, which promises well; the North China lilac, Syringa villosa, which seems to be perfectly at home; and the old fashioned matrimony vine, Lycium vulgare, which seems to be as hardy here as in the old fashioned eastern garden.

OWATONNA TRIAL STATION.

E. H. S. DARTT, SUPT.

Mr. President and Members:—Perhaps I can do no better than to review briefly the work of the station up to the present time. The law establishing this station provides by section one that "An experimental station be and is hereby established on the State School Farm at Owatonna, in this state, for the purpose of producing new and valuable varieties of fruit trees, thoroughly testing promising varieties we now have and securing reliable reports in regard to fruit, forest and ornamental trees best adapted to our state."

It has been the effort of my life to carry out the provisions of this section. And since our greatest need is apples for all seasons of the year, of fair size and good quality, that will endure our climate and be productive, I have bent my energies largely in this direction. In starting out I found no well beaten path, and guide boards and pointers were few and far between.

I must advance or, at least, make an effort, and so I blundered on, and I now feel that my last blunder is the best of all. I have blundered onto a way by which I can fully test the hardiness of a fruit tree without waiting for a hard winter. This will enable me to make much more rapid progress and must be a great help to other experimenters. In the beginning I planted my seeds and have since grafted of this class by selection about five hundred varieties; I also gathered in as many as possible of the large number of seedling varieties that were thriving and coming into notice all over the northwest. Some of these were being boomed by interested parties, and it seemed quite essential that they should have an impartial trial. Russian varieties were not forgotten, and we now place them on a par with American seedlings; a very few will succeed, a great many will fail. It is the fashion for young trees, as well as young people, to revel in vigor, youth and beauty till they produce their first heavy crop, which so reduces their vitality that they are quite likely to sicken and die from the effects of a hot summer or a winter of moderate severity. On this account it seems like a useless waste of time to describe and laud our new varieties till they have passed this critical period.

As to men and fruit trees in Minnesota, we do not need new productions so badly as we need to have the fool-killer hurry up. I believe I am doing good work with my little saw as fool-killer among apple trees, but I would not take the other job lest in persistently following the line of duty I might be compelled to commit suicide.

I have known for a long time that highly cultivated rich land was

conducive to blight, and I thought that while waiting for a hard winter I could test the trees as to their blighting proclivities. A portion of the ground covered with trees from one to three inches in diameter, standing from three to eight feet apart, was manured quite heavily and well cultivated. Many of these trees had been girdled by the spiral method the previous season, and nearly all girdled trees were well loaded with fruit the size of peas on the first of June, when a succession of freezes made a clean sweep. Not an apple matured. Fully one half the trees were again girdled, mostly in June, by what I have called the surface method. A horizontal cut is made with a saw half around the tree near the surface of the ground; then make a similar cut on the opposite side of the tree an inch or two below the first cut. This is a very severe test, as it prevent a free flow of sap and renders the whole body of the tree quite susceptible to sunscald, or bark-blight, which may be regarded as interchangable terms. This plan of manuring to cause blight and girdling to cause early maturity has resulted in the destruction of a great many trees during the past season. Now, if all varieties suffered alike it would be useless slaughter, but that is not the case. All of those varieties noted for great hardiness and freedom from blight have suffered little injury, whilst those of doubtful hardiness and blighting tendencies have been killed by the hundred. Seedling F. T. and seedling Z. have been brought into bearing by girdling. The former is a fine, large, cooking apple, the latter a highly colored good crab. They have been manured, well cultivated and twice girdled, once by the spiral method and one by the surface method. Both trees blossomed and set fruit last spring and are now in apparent perfect health.

Such illustrations of innate hardiness are frequent, and I have come to the conclusion that trees, like men, will stand a certain amount of injury and live, some vastly more than others; and that it makes little different whether the injury comes from a gunshot wound, a frost bite or the tree killer's saw. I have noticed that young trees are more frequently killed by girdling than older ones. I suppose this is natural. A man can endure greater hardships than a boy. The boy is often remarkably tough in more ways than one, but he is eclipsed by the full grown man — except in stealing apples.

In the station orchard there has been no material change since the condition of all trees was reported a year ago. Cultivation has been very thorough with the view of killing out quack grass, which has become troublesome. Blight has been quite general, nearly all varieties being slightly affected, and a very few seriously. Girdling by the surface method over a portion of the orchard has shown no visible effect except the killing of a few of the smaller trees by sunscald, twig-blight being the same on girdled and ungirdled trees. It is expected that as a result of this girdling the crop of next season will be materially increased.

A portion of the orchard is on a high northern slope, and this part produced several bushels of apples. The varieties that bore most are Duchess, Patten's Greening, Okabena, Arabian, Anisette, Stepanoff, Groseo, Skalanka, Anisim and an unknown Russian like

Duchess. It is likely that many other varieties would have been equally productive had their location been favorable.

I might mention forest and ornamental trees, but my paper is already too long. I think it is well for us hobby pushers to remember that many of our facts and theories that seem of great value to us receive little or no attention from the masses of the people. We may safely torture a fruit tree by way of experiment clear up to the killing point, but it is hardly prudent to torture an audience with a long winded harangue without pith or point.

Mr. O. F. Brand: In speaking of Mr. Dartt's method of girdling, I wish to mention the plan that I have adopted of bringing young trees into bearing, which seems to me has some advantages over his method of girdling; I have girdled some in the same manner he has. My plan is to take a tree from two and a half to three feet from the ground and take out a piece of bark clear around the tree, a little more than an inch wide, and then take a piece of crab apple bark and fit it in there; it makes a good union and produces the result of making the tree form fruit buds. It makes a good growth, and the fruit buds are all there now. That is all I know about it. It is going to make every tree fruit and blossom next spring. I think if the wood of the trees continues to live and you want to bring it into fruiting, with a possibility that it may be a good apple, you want to continue the life of the tree, you do not want to kill it by girdling. This process will make the tree live longer. All the wood that grows under the crab layer will be crab wood, and it has advantages over girdling and top-grafting.

Mr. O. M. Lord: Would you have any preference as to the crab?

Mr. Brand: I see no difference in the union. I would use a late keeping crab.

Mr. J. W. Murray: I want to ask a question in connection with a somewhat singular experience. I have some Whitney apple trees, and they bear splendidly every year, but there comes along a brown beetle, something like a common tumblebug, that knocks of the whole Whitney crop. They bear every year, but it is of no use to raise them. These beetles come in thousands, like a swarm of bees, and I can count as many as a half to a dozen on one apple. I cannot get any apples at all off the Whitney, but they do not molest the others. I should say that a year or two ago they did barely touch some of the others, but not worth mentioning, but this year they did not touch anything else but the Whitney. I would like to hear from others as to whether they have had the same experience.

Mr. G. H. Van Houten, (Iowa): We have had the same difficulty with the Whitney in our part of the country; the only reason it did not get out is because we have not been complaining. I know of no remedy. The only thing I could suggest would be to gather the apples before they are fully matured.

SAUK RAPIDS TRIAL STATION.

MRS. JENNIE STAGER, SUPT.

Nearly all the plants set this spring have lived and done well. Several of the plum trees set two years ago fruited this fall. We thought the Rockford exceptionally fine. Our grape vines, which I reported all killed this spring, to our great surprise sent up strong canes from the roots and with the exception of Moore's Early and and two white varieties are all alive. We had the largest amount of fruit this season that ever we have had here and of all kinds, and the fine weather this fall gave us plenty of time to take proper care of the plants.

WINDOM TRIAL STATION REPORT.

DEWAIN COOK, SUPT.

Strawberries in spite of the late frost bore a very heavy crop. The perfect-flowering varieties were injured considerably more by the frosts than the pistillates. The Warfield was injured by late frosts the least of all, and the fruit also was in better demand than any of the other varieties. The Bederwood is my most valuable perfect-flowering variety, but its fruit does not color up well until too ripe to handle well. The Crescent was second only to the Warfield in yield and general appearance. The Capt. Jack rusts too much. The Enhance is a valuable, large, late berry but is not of an attractive color.

Currants bore a very good crop, especially the Red Dutch. Long Bunch Holland is a valuable late currant, but the fruit is too acid to be generally liked except for jells, etc.

Raspberries, as usual, were not very good, anthracnose being the cause. The Loudon gave us some very fine fruit, and they do have the ability to hang on the bushes several days after they are ripe. Quite a few Loudons were shipped to this market from Wisconsin and sold at from 15c to 30c per quart, but the berries had to be sorted first. Our experience here is that the Loudon is not firm enough for a shipping berry.

Our apple crop was a total failure, and the plum crop nearly so. The plums were not only inferior in size but also in quality.

I believe that fruit trees are going into winter quarters in fair condition. I don't think that the warm September and October weather started the sap very much. There is an abundance of moisture in the ground. I noticed a good many blossoms on my strawberry plants in October, but no other evidence that the weather had been too warm.

VIOLA TRIAL STATION.

WM. SOMERVILLE, SUPT.

Our fruit trees passed the winter and came out in the spring in good shape. The winter had apparently not injured anything that bears fruit. The apple and plum trees came out in such bloom that there appeared no room for any more blossoms, but the late frost upset our calculations for a large crop, and we had to be content with what we got: that was, a small crop of plums, enough for our family use.

As for apples we raised more in proportion than our neighbors, which I attribute largely to the evergreen hedge that surronds our orchard. I believe more than three-fourths of the crop of little apples on the farm that had been frozen fell off; yet we had more than I expected after seeing so many fall off the trees.

Mr. Knapp, the stewart of the insane asylum at Rochester, and Dr. Kilbourne, of the same place, came to see us while the apples were sti l on the trees and contracted for what we had with the exception of what we wanted for home market and use. We sold them 400 bushels, 200 bushels of Duchess and Striped Anis and some other summer varieties, for fifty cents per bushel, and over 200 bushels of fall and winter varieties, such as Wealthy, Hibernal, Patten's Greening and others, at sixty cents per bushel. Including our home market, our crop was 600 bushels at least, and for an off year and for a June freeze we came out as well as could be expected.

Our berry crop was light, the freeze killing most of the blooms. Our grapes were a fair crop.

Considering the season, our fruit trees have all ripened wood in good shape and are going into winter quarters in good condition, though I fear the dryness of the ground may be against them, especially on light soil.

THE RIGHT WAY TO SET OUT TOMATO PLANTS.—Young tomato plants when growing up thickly in hotbeds or flats will invariably become spindling and weak. If planted out in the usual way, they have either to be inserted so deep that the roots will come in direct contract with the poorer subsoil, or the stems bend over and the tops fall upon the surface of the ground; and they will never make strong, healthy plants. Of course, strong, short, stocky plants are the best to set out, but if these cannot be had spindling plants may be made just as serviceable if planted as shown in our illustration. By this method the fine roots are nearer to the surface and the part of the stem underground will soon strike additional roots, thus giving the plant still more substance and nourishment.

ANNUAL MEETING, 1898, SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

CLARENCE WEDGE, ALBERT LEA.

The meeting of the Southern Minnesota Horticultural Society, in joint session with the Fillmore County Horticultural Society, at the city of Austin, Jan. 13th and 14th, was a very perfect success in every way. The weather was propitious, visiting horticulturists numerous and the local attendance the largest of any horticultural meeting we ever attended. From seventy-five to one hundred interested people were on hand at each session, and the fact that the membership increased from fifty-three for last year to eighty-one at the close of the meeting tells the story of a growing interest in horticulture most eloquently.

In the absence of the president of the Fillmore County Society, Pres. J. C. Hawkins held the chair throughout the meeting. His opening address was filled with words of encouragement and cheer for the workers along our line; and it would be an injustice to the commonly expressed sentiment of the members if we did not mention the fact that the success of the meeting was largely due to the energy, tact and good judgment of our worthy president.

Following this address, Edson Gaylord, of Nora Springs, read a paper on "The Apple Orchard" which made the sparks fly here and there. He hit the Russians hard and stunning blows; said that we have no use for any of them except as stocks on which to top-work the choice tender varieties, and turned around and spoiled the smiles of the seedling men by saying that there was not a seedling of established value for our section in the whole list. He bases his hope for future orcharding on a wise selection of site, careful training of tree and a judicious selection of stocks on which to work the choice old-line varieties.

Mr. Belden's talk on the "Management of Currants and Gooseberries" followed. He emphasized the certainty of this fruit in our climate and its great usefulness in the household economy when so cared for as to bring out its best size and quality. In his own practice he uses stable manure very freely, forking in that which is well rotted and using the coarse manure as a mulch. He has four different patches, in varying exposures, and finds it an advantage to have them so arranged as while those in one exposure may be injured by frosts or drouth, another will be exempt, and thus a partial crop is assured. The white currant is a favorite for all uses and as easily grown as the red. He has largely controlled the mildew on gooseberries by mulching freely.

The afternoon session was opened by a paper on "Evergreens for Minnesota" by J. A. Jenson, Rose Creek. He has observed that the evergreen is always a failure in blue grass and quack grass, but responds as readily to good cultivation as a crop of corn. He puts Black Hills spruce at the head of the list for hardiness; Scotch pine next; Douglas spruce not a success with him; red cedar seems to need protection as a young tree. Discussion brought out the fact that the white pine is very variable in this section, being re-

ported by some as their best evergreen, with fine trees sixty feet in height, and by others a failure, from the nursery to the brush pile.

J. S. Harris suggested a way of watering trees by pouring water into holes made with a crowbar within a few feet of the trees. This method is economical of water, as it rapidly reaches the roots of the trees and suffers less loss by evaporation. Mr. Harris mentioned the jack pine and ponderosa pine among his list of valuable evergreens, and said that white spruce should be found on every farm in the state.

Wm. Somerville, of Viola, gave the society an interesting talk on "Evergreens." He would discard the arbor vitae as unreliable and thinks the Scotch pine will live with the least moisture in the soil of all evergreens; while pine is a failure on the prairies, considers an evergreen windbreak very desirable about an orchard; finds that they do not sap the ground as do the cottonwood and willow; picks his finest apples for the fair on the trees next to his windbreak rather than in the centre of the orchard. Dartt, of Owatonna, don't like to hear the balsam fir praised, and don't place much stress on an orchard windbreak.

Mrs. M. D. McConnell gave an interesting resume of her experience with small fruits, and gained the cordial good will of the society by taking the most prominent part of all of the ladies present.

S. F. Leonard, of Washington, lost all his Wealthy and Haas in the hard winter of '84-5, but is still planting; derives an annual income of $50 to $125 from some thirty to forty of the older trees in his orchard; finds the Hibernal nearly as easy to propagate by layering as the currant.

A specimen of a root-grafted Hibernal was here shown by S. D. Richardson, of Winnebago City. It was seven years from the graft and had its main roots from the cion, so that it was practically an own-rooted tree. When split open to the spot where the original union with stock and cion was made, it was found to be slightly discolored but was entirely overgrown with healthy white wood. Mr. Dartt suggested that where good thrifty sprouts came up where a good variety has died, if above the graft they should be saved, as they will make bearing trees quicker than new nursery trees planted in their places.

J. B. Greenlee, of Chatfield, has found a direct deal with the nursery a very satisfactory way of getting nursery stock. Robert Parkhill has a tender place in his heart for that noblest work of God, an honest tree agent, and believes in starving out the dishonest agent by spreading the work of our society. Would have the elements of horticulture taught in our public schools.

The Grand Army Hall was filled as full as could be comfortably seated in the evening, and the session was made delightful by song and recitation interspersed among the more solid features of the meeting. After a greeting and welcome by the mayor of Austin and a response by one of the members, Jonathan Freeman read a valuable paper on "The Moral Influence of Horticulture," which was followed by interesting papers on the garden and home surroundings, by several ladies of Austin.

Pres. Underwood, of the state society, arrived on the evening train in time to be introduced to us and to say a few cheering words.

The Friday morning session was begun by the reading and adoption of a new constitution and by consummating the union of the two societies under the name of "The Southern Minnesota Horticulture Society," with stated circuit of meetings from Albert Lea to Austin and Spring Valley.

J. C. Walker gave his experience in apple growing, which extended back into the sixties. Pewaukee was twelve years in coming into bearing, matured one crop and died of blight. Sets his trees four to six inches deeper than they stood in the nursery to prevent injury by drouth.

C. G. Patten, who has spent thirty years in horticultural work at Charles City, Ia., only thirty miles south of the state line, said that of all the varieties he has tried from various parts of the country he finds the greatest hope in those he has originated from seed. Notes especially the fact that such productions make a more vigorous nursery tree than the old line or Russian varieties.

Mr. Dartt read his report on station work and enlarged somewhat on his experience with girdling as a test of hardiness.

Mr. Underwood said that he had lost in all over 6,000 bearing apple trees and is now certain that he could have saved them largely had he attended to their need of moisture in severe winter drouths. Believes in thorough cultivation once or twice a week all summer as a means of conserving moisture.

J. B. Mitchell, of Cresco, believes that our climate is constantly changing for the better, and that a more tender class of trees can now be successfully grown than could have been twenty-five years ago. The San José scale is, in his opinion, a dangerous pest and should be closely guarded. We may not be able to avoid it entirely, but should at least try to hold it at bay until it may lose some of its pristine vigor and viciousness.

A call for best varieties of apples brought the following responses:

	Duchess	Haas	Whitney	Charlanoff	Tetofsky	Wealthy	Minnesota	Seedling	Anisim	Hibernal	Patten	Malinda
Walker	1	1	1									
Gardner	1			1		1						
Guy	1		1		1							
Watkins	1						1					
Lightly	1	1						1				
French	1					1						
Morgan	1					1			1			
Leonard	1									1	1	
Somerville	1					1			1			
Gaylord						1				1		1
Harris	1					1			1		1	
Freeman	1					1						1
Richardson	1					1	1					
Kimball	1						1			1		

The election of officers resulted as follows: president, J. C. Hawkins (by unanimous vote); vice-president for three years, O. L. Gregg, of Mower Co.; vice-president for two years, Jonathan Freeman, of Freeborn Co.; vice-president for one year, O. W. Moore, of Fillmore Co.; secretary and treasurer, Robert Parkhill, of Chatfield, Fillmore Co.

The work of the afternoon session was well sustained and the attendance full, but the time of the secretary was so much taken up with committee and other work that very meagre notes were taken. Papers were read by Messrs. Underwood, Gaylord and Gardner, and instructive addresses given by Messrs. Kimball, Christgau, Dinsmore and Harris.

The report of committee on fruit list was received and adopted. The list is as follows:

FRUIT LIST.

Adopted by the Southern Minnesota Horticultural Society, Jan. 14, 1898.

APPLES.—Of the first degree of hardiness: Duchess, Hibernal, Charlamoff.
Of the second degree of hardiness: Wealthy, Longfield, Tetofsky, Malinda.
Promising varieties for trial: Pattens, Okabena, Peerless, Repka Malenka, Anisim.
CRABS AND HYBRIDS.—Best for general cultivation: Virginia, Whitney, Minnesota, Sweet Russet.
Crabs and hybrids for trial: Dartt, Pride of Minneapolis.
PLUMS.—Best for general cultivation: Desota, Cheney, Wolf, Rollingstone.
Most promising varieties for trial: Rockford, Wyant, Ocheeda, Surprise, Aitkin.
GRAPES.—Concord, Delaware, Moore's Early, Worden.
RASPBERRIES.—Red varieties: Turner, Cuthbert, Loudon, Miller.
Black and purple varieties: Ohio, Palmer, Nemaha, Older.
BLACKBERRIES.—Ancient Briton, Snyder.
CURRANTS.—Red Dutch, White Grape, Victoria, Long Bunch Holland.
GOOSEBERRIES.—Houghton, Downing, Red Jacket.
STRAWBERRIES.—Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Enhance, Lovett.
NATIVE FRUITS.—Dwarf Juneberry, Sand Cherry.

Resolutions on the value of the work of Prof. J. L. Budd were introduced by F. W. Kimball and passed unanimously as follows:

"Realizing the benefits that have accrued to us from the efforts of Prof. J. L. Budd in the introduction of Russian fruits, and realizing in a measure the obstacles he has met and overcome, we congratulate him on his success and tender him our hearty thanks."

J. S. Harris, the father of Minnesota horticulture, was made an honorary life member of the society, after which the meeting adjourned, to meet next January at Spring Valley, at the call of the executive board.

Transmitted to A. W. Latham, secretary of Minnesota State Horticultural Society, in accordance with the terms of the constitution, adopted January 14, 1889.

CLARENCE WEDGE, Retiring Secretary.

BEST THREE PLUMS OF MINNESOTA ORIGIN.

J. COLE DOUGHTY, LAKE CITY.

There are plums and "plums," but it is beyond my comprehension why plums are always associated with "soft snaps," so to speak. When a Minnesota man receives a consular appointment or falls heir to a fat post office appointment, the papers announce "a plum for Minnesota." This is not, however, strictly speaking, always a a "plum of Minnesota origin," but it is a good thing nevertheless. Had I replied to this query before the last grand jury and the St. Paul Globe got in their work, I might have said that the three best plums of Minnesota origin were aldermen of the city of Minneapolis, warden of the state prison and member of the legislature in a senatorial year. You can take your choice and name them in the order of your preference.

Speaking to the subject, I am compelled to confess that your honorable secretary has propounded a conundrum not easily answered. Let me ask how many of this most intelligent audience of advanced horticulturists can say how many and what plums are of Minnesota origin? I shall endeavor to confine myself to the only record accessible to me at this time, viz: the reports of the State Horticultural Society and the published bulletin of the Cornell University, of New York. I find that these authorities enumerate no less than thirty varieties, many of them, 'tis true, so modest and unassuming as to be unknown outside of the grounds of the originator and whose only epitaph consists in a brief mention, perhaps, in some plum discussion of this honorable body. They are lost to posterity and, perhaps, like many men, were only prevented from making a mark in history from the want of an opportunity. This, however, does not prove their want of merit. But I think I hear the president say "Stick to the text, Brother Doughty."

According to Prof. Bailey and this society, Minnesota has the honor of being foster mother to no less than twenty-five brand new plums. This list I find as follows:

Harrison's Peach, W. W. Harrison, Minneapolis; Le Duc, Gen. W. G. Le Duc, Hastings; Little Seedlings, Leudlof's Green, Leudlof's Red and Newton Egg, Chas. Leudlof, Carver; New Ulm, C. W. H. Heideman, New Ulm; Ocheeda, H. J. Ludlow, Worthington; Kopp, Late Rollingstone and Rollingstone, O. M. Lord, Minnesota City; Itasca, Ithica, Minnetonka and Wayzata, P. M. Gideon, Excelsior; Wild Rose, A. W. Sias, Rochester; Yellow Sweet and Winnebago, unknown; Weaver, origin disputed; Surprise, Martin Penning, Sleepy Eye; Harvest, Meadow, Marble, Homestead and Knudson's Peach, H. Knudson, Springfield; Aitkin, D. C. Haselton, Aitkin, Minn.

Among these we recognize some that are very good, some just good, and others no good. Among the plums mentioned, we also recognize some very familiar names. There is the Rollingstone, one of the very best of the medium late season. The fruit is very large, round, flattened, and truncated at the end, mottled and spotted, skin thick, flesh firm, sweet and excellent, a semi-cling stone;

season just before the Desota. This we recognize as one of the best of our Minnesota plums.

Then again there is the Ocheeda, a large round, yellow and red plum, with thin skin, firm flesh and of excellent quality; an excellent variety but not very well known.

Last, and best of all, we come to the Aitkin, one of the latest aspirants for public favor. We owe the discovery of this grand new plum to Mr. D. C. Haselton, of Aitkin, Minn. Many of you know its origin, but for the benefit of those who do not I will say that Mr. Haselton, while engaged in clearing a piece of land adjoining his fruit farm, discovered a plum tree bearing fruit of very large size and excellent quality. He was so impressed with it, that he began propagating them for his own use. When he came to market the fruit, he found such a demand for it that he was thoroughly convinced of its value. Samples of the variety have been placed in the hands of many of the horticulturists of this and other states, and at the experiment stations of all the northwestern states, and the reports received from them would indicate that it is the best plum for northwestern planters yet discovered. Prof. Goff, of the Wisconsin State Experiment Station, describes it as follows: "A greenish yellow ground, turning to a brilliant red, becoming fully ripe, a dark red. The fruit is oval, slightly truncated at both ends, and a little paler on the shade side; cavity small and regular. Flesh rich, yellow, tender, juicy and sweet; stone large, but remarkably thin: a free stone, and can be pared and served with cream, etc., peels readily when ripe; a prolific and regular bearer and for culinary purposes can not be excelled. The fact that this plum stands the extreme cold of latitude 46½ degrees north without injury, that it ripens very early and bears extra large fruit of uniform size and brilliant color makes it the most desirable of our native plums." The Aitkin plum is without question the earliest plum known. On the 9th of August we picked the first ripe plum from the Aitkin trees. Had we had a frost that would have injured other varieties of plums prior to the 9th of August, the only plum we would have had would have been the Aitkin.

A VALUABLE NEW GRAPE.—The Orange Judd *Farmer* says: "Early in September we received from H. G. McPike, of Illinois, a few bunches of black grapes, the beautiful appearance and excellent quality of which impressed us so favorably that we had a photograph taken of one of them. This new variety has appropriately been named "McPike," in honor of its originator, who after thirty years of careful and intelligent experimentation succeeded in raising this seedling, which in some respects is superior to any existing variety. It is a seedling of the Worden, which it resembles somewhat in general appearance, but its berries are much larger, measuring from three to three and one-half inches in circumference, are of decidedly better quality than either Concord or Worden, have fewer seeds, and these separate easily from the pulp. The bunches ripen evenly without having ripe and green berries at the same time. The original vine is seven years old, its fruit commencing to color the latter part of July. The foliage is very large, the wood shorter jointed than Worden, and the entire vine is remarkably hardy and vigorous.

BEST THREE VARIETIES OF RED RASPBERRIES FOR MARKET.

C. W. SAMPSON, EUREKA.

From what experience I have had in raising and marketing the red raspberry I would easily pick out the following three varieties as the best for market: Marlboro, Cuthbert and Loudon.

In the first place we want a berry of large size, bright red color and a firm berry—one that will stand up well when shipped a long distance by express. When we used to raise the Turner, we thought we had a splendid berry,and we did have in quantity and flavor one of the best; but they would not stand shipping a long distance, especially when allowed to get a little over ripe. They would settle down in the boxes and get mushy. Then the Cuthbert, called the "Queen of the Market" came out and took the lead for a while as the best market berry, owing to its large size, good color and firmness. This grand berry had a great run for a few years, selling 25 cents per case higher than any other berry. But disease soon took hold of them, and they went by the board. About this time the Marlboro was introduced and placed on the market as the best red raspberry in existence. The Marlboro I consider the best selling red raspberry now generally before the public. Although I consider the quality and flavor of the Marlboro very poor, the bright, beautiful color and large size sells it. People buy, nowadays, with their eyes to a great extent.

The Loudon red raspberry has lately been introduced as the best berry that ever came before the public, and from what I have seen of it and from the crop gathered the past season, I believe it will out-sell the Marlboro when placed along side of it on the market. The berry is one of the largest, of bright red color, excellent flavor, a heavy bearer and is a very firm berry, standing long shipments, and will keep in good condition three or four days after picking. They will also remain on the bushes without spoiling longer than any other berry I know of. I would raise the Marlboro for early and Loudon for late, if I was going to plant twenty acres.

Mr. J. S. Harris: I desire to take exception to putting the Marlboro in as one of the best three varieties for market. In the southeastern part of the state the Marlboro is one of the most unsalable berries we have. This past year it looked as though it were mouldy, the berries were imperfect to a greater or less extent, and the quality poor. People would pass it by and take the Cuthbert. The Marlboro is the worst infested with the borer of any variety we have, and also is troubled with the leaf curl more than any other variety we have. In fact, people are destroying their plantations set out to the Marlboro.

Mr. C. Wedge: What is the disease the Cuthbert is subject to?

Mr. Sampson: Curly leaf more than anything else.

Mr. Wedge: I have never seen it in our plantations.

Mr. Pond: How is the Loudon in regard to disease?

Mr. Sampson: The Loudon is not much subject to disease so far.

Mrs. Kennedy: I would like to inquire if the Loudon is perfectly hardy?

Mr. Sampson: We left them unprotected in several localities last winter, and they came through in first class shape. I think they are as hardy as the Turner.

Mr. Harris: I think they are about the same.

Mr. Wedge: Are they as easily covered as the Cuthbert?

Mr. Sampson: Yes; easier.

Mr. T. T. Smith: How far apart do you plant them?

Mr. Sampson: About six feet apart in the row. I used to put them 4x6 and then cultivate both ways.

Mr. H. F. Bussee: I have the Hansel, Cuthbert and Loudon. The Loudon suits me better than any other kind I have. The Hansel is very close to it in flavor, but after a heavy rain the fruit is apt to have an inferior taste the next day, but the Loudon does not seem to be affected so much. I preserved a few in this bottle (exhibiting bottle), but they are not the best, as I did not have any alcohol in the house at the time—but this shows the average size of the Loudon. A number of days before I put these up they were better.

Mr. Sampson: Mr. Harris spoke of the berry being softer than the Marlboro, but I believe it is the firmest berry I have ever seen. The canes are rather slim and inclined to fall over.

Mr. C. J. Wright: I have frequently found the Marlboro on the market, and it is the best selling berry I have. I think a great deal of it.

Mr. Sampson: One reason why I named the Marlboro is because on the north side of the lake they raise the Marlboro altogether. In that locality it does the best and sells the best, and they do not raise any variety but the Marlboro, and they ship more fruit from there than from any other point in Minnesota.

Mr. Busse: Are they as hardy as the Turner?

Mr. Sampson: No, I do not think they are.

Mr. C. L. Smith: I want to call attention to this fact: Where the Marlboro is so successful in this part of the country there is a very rich, heavy soil, a heavy clay subsoil, a soil that holds the moisture well, while in the southeastern part of

the state the soil is lighter and more sandy and does not hold the moisture; and that is the reason why the Marlboro does better in this locality.

Mr. O. M. Lord: In our vicinity the soil is sandy, and we had to discard the Marlboro. I would prefer the Cuthbert, Turner and Miller.

Mr. Harris: You would not leave the Loudon out, would you?

Mr. Lord: So far as the Loudon has shown itself on my place, I have nothing to say about it.

Mr. T. T. Smith: What is the character of the soil?

Mr. Lord: Sandy.

Mr. T. T. Smith: Have you not the hazel brush soil?

Mr. Lord: No, sir.

THE BEST FIVE GRAPES FOR MARKET.

A. D. LEACH, EXCELSIOR.

I will tell you, to start with, that I have never grown more than five varieties of grapes, and what I know of others I have learned by observation and inquiry. If my list does not suit you, criticise it as much as you wish, and perhaps I shall learn something, if no one else does.

My first choice is the Delaware. In my way of thinking, the Delaware is the most profitable and, consequently, the best market grape grown in this state. I have grown it for nearly thirty years, always with satisfactory returns. It is the best because it brings the highest price of any grape I know of; it comes to perfection in this climate; the vine is hardy, and healthy if properly cared for, and will bear close pruning. Delaware vines will bear a full crop of compact and beautiful clusters, often weighing from one-half to three-fourths of a pound. There are several reasons why the Delawares bring a high price as compared with other varieties. I think most people like it for the table better than any other kind. Then, there are less Delawares sent from the south and east than of the black varieties, and those that do come compare very unfavorably with our home-grown. I have Delaware vines twenty-eight years old that are quite as thrifty as they have ever been and are bearing as well as they ever have done.

My second choice for a market grape would be the Moore's Early, although the slow growth of the vines has made it rather unsatisfactory to me, but the clusters and berries are large and have a very good flavor and are held in high favor by many growers of grapes. It has the advantage of being the earliest of all of the black varieties of grapes, as far as I know, and as it is the first in market it usually sells for good prices.

My third choice is the Brighton, which, in color and flavor, somewhat resembles the Delaware, though somewhat more spicy. The clusters are not as compact, but the berries are larger, and I believe

that when it is better known in our markets it will be highly appreciated. It ripens at about the same time as the Delaware.

My fourth choice is the Concord, a fine grape of very thrifty growth, and it has always been perfectly healthy for me. It requires somewhat different pruning from the Delaware to secure the best results.

Many people are fond of the Concord as a fine eating grape, and it is used very much for jelly and canning. Concord grapes have been sent from New York and other places in such quantities that the price has been very low for several years, hardly paying the cost of raising them.

My fifth choice is the Janesville. It is a sour and, in my opinion, an almost worthless grape, except for canning and jelly, but it has the redeeming quality of being very hardy and early and can be sold to some advantage before most other black grapes ripen.

If I was going to put out a vineyard at present, I should plant at least ninety per cent Delawares, and I don't think I would lose anything if I should plant the other ten per cent to Delawares, also. Nevertheless, for varieties sake, I think I would plant a few Moore's Early and Brighton, and several other kinds for my own use.

Mr. Harris: I would like to inquire if the gentleman has ever tried the Worden grape.

Mr. Leach: I have never raised any Worden grapes, but I have eaten them. They are a fine grape, but they are too apt to mildew to raise for a market grape. I do not think there is any grape that is paying much at present except the Delaware. Blue grapes seem to be all in one lot; you take the Moore's Early, the Worden and the Concord to market, and they make no difference, they are all the same price. They bring from ten to fifteen cents a large basket, while Delawares netted me this year about eighteen cents a small basket. The Delaware with me will bear as many grapes as any kind of a vine I ever had.

Mr. Harris: In our La Crosse market I make more money out of the Worden than out of any other grape I have. The Delaware is not popular there. I find the Worden is a little larger than the Concord, and we get from one to two cents more than for the Concord.

Dr. M. M. Frisselle: I am inclined to agree with Mr. Leach that the large proportion of vines cultivated for profit in this region should be the Delaware. I have planted some of the Brighton, I have quite a number of those vines, and I am inclined to believe that the Brighton is the coming grape. It ripens early, its clusters are large and the vine is very prolific in fruit. The objection to the Moore's Early is that it is a very slow grower, a shy bearer, and the fruit itself is

too foxy for agreeable use. It belongs to the Concord variety. I think when we see a number of varieties exhibited at our state fair in the horticultural department, thirty, forty to fifty varieties, it seems to me queer that we come here and talk about the five best varieties. The fact of the matter is, in my opinion, there are not over five varieties that are fit to be cultivateed for the market, and those that are cultivated frequently are not fit for market or family use. I think we can reduce the number of varieties that are really desirable to three varieties instead of five: the Delaware, Brighton and Concord or Worden. I think the Worden is equal to the Concord, and I think it would be preferable. I think those three varieties would be all I would recommend the general public to cultivate.

Mr. Dartt: Did any one ever cultivate the Janesville?

Dr. Frisselle: Yes, sir; you can generally sell the Janesville once to people, but that is all.

Mr. Harris: I think those three varieties are all that I would recommend. The Janesville is a handsome grape and turns black early, and the people who buy it try to eat it and think they have eaten grapes, but they are sour grapes.

The President: I just want to say a word about the Janesville. I took several farmers through our vineyard several years ago, where we had all kinds of grapes, fifteen to twenty kinds, and six or eight of the best kinds, such as the Delaware, Brighton, Concord, Moore's Early, Worden and so on, but I did not say anything about the Janesville; I did not show them the Janesville at all, because I thought they would not like them, and I was going to give them the best I had. But they finally saw the Janesville and asked, "What grape is that?" I told them that was the Janesville; they ate some of them, and they thought it was the only good grape they had tasted. (Laughter.)

Mr. Harris: I was going to suggest that for the farmer the Early Victor was a better grape than the Janesville. It is a pretty good eating grape.

Mr. Leach: My paper does not treat of the best grapes for eating, but for market purposes. What we want is the grape that brings the biggest price in the market. There is no question but what the Delaware will bring a higher price than any other, and so the Delaware is really the best grape for market, and I might say the only grape that is worth cultivating here for the market.

BUYING NURSERY STOCK.

W. M. NEWMAN, MINNESOTA AGRICULTURAL COLLEGE.

At first glance one would almost wonder how the subject of buying and selling nursery stock could be connected with horticulture but when we get down to the real matter of the subject we will find that there is perhaps no subject in horticulture of more importance to the average farmer of Minnesota than that of buying his nursery stock. If every farmer in this state knew how to go to work to buy the right kind of stock for planting, then indeed would horticulture take a great step in advance of what it is at the present time.

It has always been the practice of writers on this subject to call down the indignation of the people upon the men who are defrauding the farmers into buying worthless nursery stock, and quite rightly, too, so far as they go; but they stop half way and do not get at the root of the matter, and instead of stopping the infamous work of "tree sharks," they only prune off the dead or worthless branches, and the old tree brings forth more fruit.

I would say to some of those men who are forever belittling the business of a nursery salesman, that they should not be too harsh on those men who defraud others, but should be on their own guard lest they also be tempted.

It is useless to deny that a vast amount of fraud has been perpetrated upon the planters of this state, but, I ask, what is the reason for it? Has any member of the horticultural society been beguiled into buying "Thornless Gooseberries," "Evergreen Blackberries" and "Apple trees that grow fruit under ground, so that there will be no danger of the blossoms freezing," etc. No; men who understand something about the laws of nature and have taken advantage of other men's experience in this matter, do not get duped by so-called "tree sharks."

So far have the majority of the people of this state remained in ignorance of the most common facts about fruit raising that all that is necessary in order to dupe them is to learn some new song about some wonderful discovery in northwestern fruit raising, and then sing it in a pleasant manner, and the fish is caught, the stock is bought, and the farmer sold. I used to feel a certain amount of pity for those men who were sold for a song, but when I see the opportunities they now have for knowing better, I cannot have much sympathy for people who willfully neglect the chances they have to know about these things.

Sometimes their being beaten in this way is good for them, as it teaches a lesson not easily forgotten, and they will afterwards patronize a nursery which they know is doing a good, honest business; but still there are so few farmers who know of such nurserymen, and the more general effect is to cause them to shun every agent for nursery stock as they would a plague, and they are apt to lose good chances of getting stock that would do well with them and, consequently, are twice beaten.

Now, as a remedy for this state of affairs, we have only to use the means already provided and, that is, become members of the State

Horticultural Society, and then through that get the experience of men who have been raising fruit for years. Membership in the society is the medicine, but unless the medicine be taken into the system and assimilated it can do no good; so the monthly magazine and reports will be of no use to you on your book shelves. Get the information where you will be able to put it into practice.

If every man who plants trees next spring would do this, I venture to say that in less than two years the animal known as a "tree shark," who goeth about seeking whom he may devour, would become a thing of the past; but just so long as people are looking for the impossible and wonderful, just so long will there be men whose brains can invent those monstrosities to please the fancy of those people who could not be persuaded to buy a good thing. It has been said by some one, and in the nursery business demonstrated as true, that "you can fool all the people some of the time and some of the people all of the time," but let us hope that it will not be that all the people can be fooled all the time, which is nearly the case today.

PLUM PUFFBALLS.

PROF. L. H. PAMMEL, AMES, IOWA.

The puffed appearance of the plums is due to a parasitic fungus which is not mature in the specimens sent me. It is commonly called plum pocket, or bladder plum *(exoascus communis)*. The fungus appears soon after the petals fall, the plums enlarging rapidly until they are many times larger than natural size; they are hollow and with occasional shreds. When mature they are somewhat mealy because of the spores. The fungus causes an increased activity in the tissues of the host, hence the enlarged plums. The mycelium (vegetative part of the fungus) is perennial and hence when a tree is once affected the disease annually occurs. I have had several queries concerning this disease in Iowa this season. Col. Brackett, of Denmark, writes that of many varieties of plums on his grounds, the Cheney is the only one affected. Here on the college grounds the same variety has been seriously affected for several years. What should be done? An early application of bordeaux mixture or ammoniacal carbonate of copper to the twigs will kill many of the adhering spores, and when the disease has appeared it is advisable to cut back the branches and burn them. When a tree is badly affected, the whole thing had better be removed. There are many other kinds of this class of fungi; one kind produces disturbed and swollen branches on Chickasaw and WildGoose plums. Another kind is the so-called peach-leaf curl. A third kind affects the poplar. Climate seems to have much to do with the severity of the disease. Dr. Erwin F. Smith has observed that a sudden fall of temperature has a marked effect in producing epidemics of this disease. The writer noticed the same thing a few years ago on the peach-leaf curl fungus here at Ames. In case of peach-leaf curl, when trees are badly affected they recover but slowly. Every one should carefully note the varieties of plums and peaches affected, and select for planting only such as are least subject to the disease. We have in previous numbers of this journal commented on selections of plants to prevent diseases. This is not given the attention it deserves.—*O. J. Farmer.*

THE LUMBERMAN'S PLAN FOR FOREST RESERVES.

M. O. NELSON, MINNEAPOLIS.

In the language of the political economist, the lumberman's plan of forest preservation is the policy of *laissez faire*, or translated into English "as she is spoke," it is the policy of "let her go." The lumberman's *plan* for forest reserves, in the language of the books, is *nil;* in the language of the street it is "nit"; in plain English,—there is no plan.

The topic of this paper then is a myth, so far as I have been able to discover. No such plan has been evolved among the lumbermen. No two lumbermen, so far as I can find out, wholly agree as to methods of forest preservation, and but few have stopped in their profession of forest destruction long enough to think consecutively and to a conclusion on the subject of forest preservation. I do not mean that the lumbermen of Minnesota and the neighboring states are all thoughtless vandals, wasting the natural resources of the state without care as to how the future must pay for the excess of today. There is practical serious thought among many lumbermen as to the best that can be done under existing circumstances The lumberman in working out a conclusion usually counts on existing circumstances. This makes him an exceedingly practical man—sometimes too conservative in matters of reform.

Though no plan for forest reserves has been generally thought out, thinking has been done about the matter, and this thought, so far as I have been able to get at it, forms the subject of this paper.

One conclusion the lumbermen of the white pine region seem to have all independently reached, the white pine forests can not be saved for future generations; from ten to twenty years will end them. Their reasons for this conclusion seem practical. They say the most of this timber is in private hands. Against the timber owner are pitted three covetous elements that fight to get the pine; those elements are fire, the thief and the tax gatherer. All three covet pine above all other woods,as the burglar covets silver spoons above all other household goods.

The arch enemy of pine is fire. The Minnesota Forestry Association knows this far better than I can tell them, and their plans for defeating that enemy are better than I can give them. I will say that the lumbermen of this state are in hearty accord with those plans for preventing fires. As to the danger from fire and the method of escaping its destruction, I will briefly sum up what the lumbermen have told me.

(1) The danger from fire increases every year. There are now no large blocks of virgin pine in this state. Look at the maps of private timber holdings; they look like jumbled up checker boards. Between every quarter section or forty, some settler or other stranger owns a quarter section or a forty. Every year the settlers increase and the danger from fire increases. The settler must burn off his land and must burn when the brush is dry. You know the rest.

(2) Pine slashings are ugly accessories to forest fires. How can they be rendered less threatening to timber interests? The lumbermen have found but two plans of prominence, the one to cut off everything of worth that might be destroyed by fire, the other to clean up the tree tops after logging. Last year a Wisconsin concern of large interests attempted to clear up the slashings from its summer logging in order to protect its own standing timber. It found the cost so great that it gave it up in despair and ran the risk of fire loss rather than incur the certain expense of the clearing up.

I have asked lumbermen to estimate the cost of clearing up after logging. Their estimates range from 50 cents to $3 per thousand as an extra cost. I am inclined to take the lowest estimate rather than the highest, for it comes from the head of the largest logging concern on the upper Mississippi, and from a man who has spent thirty years in the pine woods.

At the present price of lumber this added expense would be prohibitive to profit in logging. Which means that even at a cost of 50 cents per thousand on the logs, no lumberman will clean up the trash of logging. What then? Only one thing is left; mow the ground bare of all the pine that will cut upward of eight feet board measure. Why not leave these very small pines? The slashings will burn some day soon, and all the small pines will be reduced to charred stumps good for nothing but for crows to perch on. Eight feet is better than no lumber, so the order goes to cut things clean.

Are there no second cuttings? Yes, a few. These are from lands that were cut some time ago when the risk from fire was not so great and when it paid to log only the best pine, or it may be that some careless surveyor has failed to locate all the pine and the cutting has not been as clean as ordered. At the present low price of lumber, some lumbermen are threatening to leave some cheap timber that it is not worth the handling; but, for all this, the rule is to cut clean, and usually the rule holds good.

The thief is the second enemy. With the increase of settlers the thieving increases. Railroads and lumbermen may have robbed the state of its pine—you know of that as well as I—but on the other hand settlers are nibbling away at the edges of the holdings of the lumbermen like mice at cheese. If mice could be tried by a jury of their peers, no mouse would ever suffer death for his depredations. The jury system is the stronghold of the pine thief. I would give something valuable for an authenticated instance of a settler being convicted of stealing logs off the land of a non-resident lumberman. I know of valuable tracts of timber that might have been left for a decade yet but for this constant thieving of the farmers. As it is, the timber is hurried to the mills to be put into such shape that stealing it may be counted an indictable offense.

The third, and about the meanest enemy of the pine, is the tax gatherer. I have heard Mr. Weyerhauser say that on many a forty acre timber tract that cost him $100 ten years ago, he is now paying $100 yearly in taxes The same thing might be told of almost any old lumberman. This would be perfectly just under certain circum-

stances, for I would be the last one to say that the lumbermen should not pay as large a per centage of taxes as the poorest farmer or village householder, but in many cases this taxing is egregiously unjust. The assessor and the tax gatherer, the town board and several other influential individuals, act in a criminal collusion. The lumberman's timber lands are unmercifully taxed to build school houses out of proportion to the needs of the children; to build bridges out of proportion to the needs of the neighborhood; and to give jobs to the settlers, who delight to rob the "lumber baron" under guise of the law.

To guard against these three enemies the lumbermen say: "Let us get our trees into bankable dollars as fast as possible. It is better to bequeath our children government bonds than these precarious holdings where fire and the worm do corrupt and where thieves break through and steal."

After the lumberman has eaten his apple, will he give the core to the state? Well, hardly. In the majority of cases the lumbermen are now saying: "They ain't agoin' to be no core."

Five years ago you could have passed around the hat and taken up a collection of almost any quantity of odd forties and sections the lumbermen were letting go for taxes, They do not do that so much now. The reasons for this are several. Many lumbermen are selling cut over lands for farms and making a little good money that way. They are coming to think that no land is so poor but that some poor devil will buy it to make a farm of. Then it is often the case that wood and tie rights are sold on these lands for much more than the cost of taxes. And beyond all that in the farther north, no lumberman is sure that he will not wake up some morning and find a hill full of iron ore on his cut-over land. So the rule now is to keep the taxes up on cut-over lands, and pay back taxes on the lands you have let go by default several years ago. This means that the amount of land the proposed forest reserve may expect from the hands of the lumbermen is growing less just at the present time.

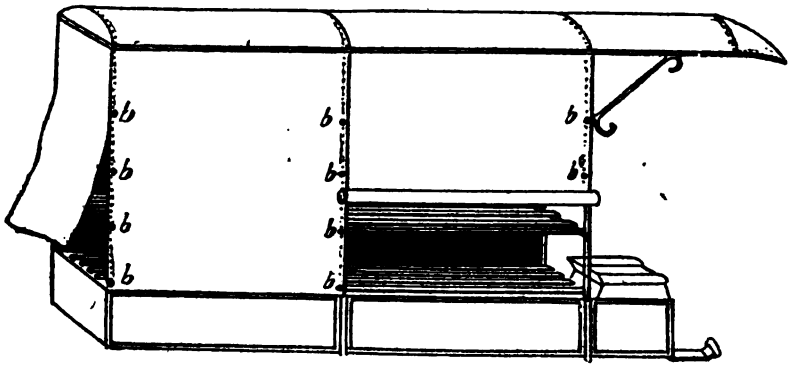
What then is the conclusion of the whole matter? It is that unless conditions materially change, lumbermen will not change their present policy regarding the preservation of pine timber. They do not much fear a lumber famine, for even now they find it hard to compete with what seems unlimited lumber from the southern and Pacific states. The present conditions they think practically unavoidable, and the swift destruction of the pine forests inevitable. As to preservation by replanting, they know as little as the same number of farmers. Therefore their policy is, as I said, that of *laissez faire*, and their plan nothing.

ANTS ON THE LAWN.—Bisulphide of carbon placed in the ground at or near the ant-hills will destroy the insects. Take a dibble or sharp stick and thurst it into the ant-hill, making a hole six or eight inches in depth; into this pour about two tablespoonsful of the bisulphide, and then press the soil together at the surface to close the hole. The fumes of the liquid will penetrate the soil and kill the ants. This is the most effective of all the means that have ever been employed for this purpose.—*Vicks Magazine for July.*

MRAKETING SMALL FRUIT.

(Selected.)

That fruit may reach the customer as fresh and attractive as possible, is the desire of growers. It is impossible to cart it any distance in the sun and have it presentable when delivered. A covering of some kind is necessary, but great care must be taken in selecting material for this purpose. Blankets or black rubber cloth are objectionable. I used to use a marble oilcloth, raised a little above the fruit, so as to permit circulation of air, but I found that this was not just the right thing, for when making my rounds the last of the fruit would be in bad condition. I decided therefore to build a top for my wagon which would exclude the sun and dust and yet allow the air to circulate freely.



WAGON FOR MARKETING SMALL FRUITS.

I examined several fruit wagon covers but found none that suited me, so I constructed one myself and it is represented in the accompanying illustration. Shelves are made of white wood slats half inch thick and two and quarter inches wide. They rest upon rods at *b* which have thumb burrs at each end and permit a change in position when the top is used for purposes other than carrying fruit. For covering I selected the best duck I could find, cut to fit the frame and stitched it together upon a sewing machine. It was then ready for fastening with finishing tacks. The sketch shows the curtains unfastened to give an idea of the interior. The front end is open so that air may circulate freely. On the outside the word strawberry is printed on a separate strip of cloth, which is movable, so that the proper word be substituted when other fruits are being sold. I can now deliver fruit as fresh in appearance as when picked, and when I drive ten miles to one of my markets the fruit does not look much the "worse for wear."

STRAWBERRIES IN CENTRAL NEW YORK.—A prominent strawberry grower of Oswego county refers to last season as the most wonderful one for receipts within his knowledge. A good many growers realize from $1,000 down to $500 and $300 from a single acre of strawberries; $52,000 was paid in for strawberries in one small town. —*O. J. Farmer.*

A VOICE FROM THE FARMER'S INSTITUTE.

A. K. BUSH,

Lecturer on Horticulture in the Minnesota Farmers' Institute.

In nearly every place we visit I find a large number who are interested and are planting trees and fruits quite extensively, many being surprised with their success when they had expected failures. They are growing small fruits, plums and apples in abundance, which means they are used and enjoyed as they can and should be in the family.

A farmer living near this city said: "I am growing all the apples my family can use, from a few trees, some varieties keeping until spring." Another said: "I have lived in this county more than twenty-five years and thought I could not grow fruits here. A few years ago I bought an assortment of fruit trees, bushes and plants from a local grower who was strictly reliable, using his judgment and experience in selecting varieties, planting, etc. Now, we are enjoying fruits of our own growing in large assortment and great abundance. I never fully understood their value before growing and using them as a staple food in my familly. I wish I had known something of the possibilities of a fruit garden and orchard and how cheaply the same can be grown even in this part of Minnesota. With such knowledge I would have had plenty of home grown fruits years ago."

The experience of this man is being repeated all over our state where Minnesota grown stock is planted, tested and approved varieties selected, using intelligent care and up-to-date methods of cultivation, setting, protection, etc., as taught by the Minnesota Hort. Society through its practical instructors and publications.

Every fruit grower in our state should make a special effort with his neighbor to extend the usefulness of this society and its work by securing additional members, who need its help and encouragement in overcoming the prejudice now existing with us against fruit growing, caused largely by planting inferior stock and worthless varieties to us, grown and sold by dealers from the south and east. Plant Minnesota grown stock and such varieties as succeed best in your locality and are on the "Fruit List," same being recommended by majority vote of members present at the annual meeting of the State Horticultural Society. Follow these suggestions,and you are sure to succeed with fruit growing in Minnesota.

COMMENDATION IS APPRECIATED.—"I consider your report a great credit to the state, and to your horticulturists; you may well be proud of the interest that you have worked up,considering the great disadvantages that you have to contend with in some respects compared with more favored localities. But I see you are not discouraged in the least, and I wish you success in every undertaking to advance horticulture."

D. M. MCNALLIE.

Sarcoxie, Mo., Jan. 25, 1898.

Secretary's Corner.

OUR MEMBERSHIP FOR 1898.—It now stands at 472 for annual members as against 282 at this time a year ago, a gain of 190 for this year. Any who have not yet done so are invited to renew at once.

HAVE YOU RECEIVED THE 1897 REPORT?—If not please notify the secretary, or if you live at or near Minneapolis call in person at the secretary's office for it and save the society the seventeen cents postage.

WHY THE 1897 REPORT COMES LATE.—The unexpectedly large number of members on the roll at this time of year has exhausted the first lot of bound volumes of 1897, and there will be a little delay in sending out the next one. It may hit *you*.

A CORRECTION.—The reporter lost the *point* of my remarks on ash seed in the last issue, (See page 12.) which was, that all the seed shipped to Milwaukee were gathered from *one tree*; which was intended to emphasize what Mr. Underwood said in regard to producing numerous varieties from the same seed. O. M. LORD.

THE PRESENT LECTURER ON HORTICULTURE AT THE FARMER'S INSTITUTE—is Mr. A. K. Bush, of Dover, Minn. This is a new field for Mr. Bush, but he brings to the work considerable experience in horticulture and an observing mind. We expect to hear of his success as the apostle of our beloved art. He is well known as one of our working members.

OUR NEW CONTEMPORARY.—Mr. Clarence Wedge's new sheet, "Northern Fruits," has found its way into our sanctum. What it lacks in size is more than made up in virilty, and we feel like saying heartily "most welcome." In the position it occupies it can say some things which the official organ of this society cannot well say, and so it makes a good complement to our journal. We wish well for this lusty infant and hope to see it grow.

A HINT TO 1897 MEMBERS.—If any member for 1897 who has not renewed his membership for 1898 and does not propose doing so, is still receiving the "Minnesota Horticulturist," will you please notify the secretary by postal at once that your name may be dropped from the roll. The purpose of the society is to do all the good possible to as many people as possible, and the way to accomplish this is through a large and widely scattered membership, and we hope you will stay with us and aid in this good work.

CALIFORNIA VERSUS MINNESOTA.—Our fellow member, Jas. T. Grimes, has returned from a visit to California, made since our annual meeting, and has been fortunate, as he believes, in exchanging a fruit ranch there for a good solid Minnesota farm at Northfield. The bug, the worm and the insidious fungus are making rapid encroachments on the fruit growing interests of the Pacific state, saying nothing of the rapidly developing fruit interests of localities only half way there. Mr. Grimes is wise in "changing" in time. His experience in this industry in both localities proves him not dissatisfied with the state of things at home.

THE NEW STATE AGRICULTURAL SOCIETY BOARD.—Do we like it? We do. In fact it so much resembles the old one that it is hard to tell the difference. Mr. John Cooper, of St. Cloud, takes the place of President Weaver at the head of the board, and the balance is as before. The friends of Maj. McGinnis and "Jim" Letson had to hustle a little, but on the final ballot both were elected unanimously, and the utmost good feeling prevailed. With this honest, capable and experienced management the state fair should take another good step upward this year in making the next annual fair a little the *best* we have ever had yet—and they are going to do it.

A HORTICULTURAL CLUB AT PARK RAPIDS.—A local club in the interest of horticulture has just been organized at Park Rapids, in our state. The president predicts "a howling succeess" and a membership of twenty-five or more to advocate our cause.

The time is evidently at hand when the interest in our art aroused by the activity and influence of the state society is to bear fruit in the form of organized local effort. No special move has been made by our officers to bring this about, but it is being done by a natural process which always brings together for further and more effective service those in whom has been aroused a common interest. A strong central organization loyally supported, as is ours, is necessarily the source of the widely spreading influence which is bringing about this result.

ARE YOUR FRUITS WELL PROTECTED?—Prof. S. B. Green, has called attention to this important subject, and the secretary can do no better than quote his language:

"In the next issue of the Horticulturist, I think it important to say something about the desirability of having strawberry beds covered deeply in winters when the ground is bare of snow. This was plainly shown, you will remember, two years ago by the general failure of strawberry beds where they were only thinly covered and the general success of them where they had been deeply covered. You remember O. C. Gregg brought this point out very plainly at his place. In fact, I think his success that year was due almost entirely to his heavy covering. This is a good time to bring this matter before our society."

With the ground so devoid of snow protection and so dry as at the present writing, it would be well to remember also that *all fruits* will endure the expected severe weather better with a good

mulch on the ground over the roots. This is apparently much more needful at this crisis than in ordinary winters.

WE VISITED THE FARMERS' INSTITUTE AT JORDAN.—Mr. Wyman Elliot and the secretary, as representing the horticulural society with Hon. S. M. Owen for company, took advantage of the presence of the institute at so convenient a point as Jordan and spent Saturday, the 15th inst., there. We found an audience of some 150 "hanging breathless" on the words of Supt Gregg and his able corps of assistants. These gatherings seem to lose nothing of interest since our last visit of several years earlier. While the state is doing so much of a somewhat paternalistic character for other classes of our people, it is certainly no more than right that the farmers should receive at least this much special attention as their share, but aside from the equities in the case it is good policy to provide this greatest of all classes in our country the knowledge needed to enable them to grow "two blades of grass where one grew before," for the whole people participate in their prosperity. We found Mr. A. K. Bush occupying the place of the lamented E. J. Cutts, as lecturer on horticulture, and rapidly familiarizing himself with the work. At an early afternoon session he talked to an audience of ladies on the ornamentals in our art and had their closest attention. His principal work in the institute now is the elaboration of a plan for a fruit and vegetable garden, to illustrate which he carries a large chart prepared specially for this purpose. It is evidently a very practical and appropriate topic.

THE MINNESOTA FORESTRY ASSOCIATION IN ANNUAL SESSION.—This gathering, held Jan. 12, in the same rooms lately occupied by our society, in point of numbers was not a success, only something like a score being present at the afternoon session, the one we had the opportunity of attending; but in the character of the audience present and its weight with the community and in the matter of the subjects presented, it was in the highest degree a success.

It is unfortunate that this society convenes on the same day as the State Agricultural Society in St. Paul, where so many of those interested in forestry find it absolutely necessary to be. This should certainly be remedied before the holding of another meeting. The subjects considered largely grouped themselves around the central thought of forest reserves and their protection, and after the presentation of the last one on the program, by Capt. J. N. Cross, a suggestion of his bore fruit in the appointment of a committee—to be announced latter—to arrange for a meeting of representatives of the states of Michigan, Wisconsin and Minnesota, for the purpose of drafting a forest reserve law, to be urged simultaneously upon the legislatures of the three states.

Resolutions of sympathy with Col. J. H. Stevens in his present domestic affliction were adopted.

Secretary Barrett was not able to be present and his son appeared in his stead. We understand Mr. Barrett's health is improving and he is likely to be out again soon.

P. S.—The committee above referred has been announced and consists of Capt. J. N. Cross, D. R. McGinnis and A. W. Latham.

J. A. Barrett

BROWN'S VALLEY, MINN.
Late Secretary Minnesota State Forestry Association.
(See biography.)

THE MINNESOTA

HORTICULTURIST.

VOL. 26. MARCH, 1898. No. 3.

In Memoriam.

JOSEPH OSGOOD BARRETT.

BROWN'S VALLEY, MINN.

DIED FEB'Y 8, 1898, AGED 74 YEARS.

On the morning of February 8th the spirit of this well known reformer, author and forestry teacher, took its flight from earth, from his home in Brown's Valley, Minn. He had been ill for some time but was not considered dangerously so until a few days prior to his transition, hence his departure will be a shock to his thousands of friends throughout the country.

Mr. J. O. Barrett was born in Canaan, Me., Aug. 21st, 1823, and would have rounded out seventy-five years on earth on his next birthday. He was a close student from boyhood, and fitted himself for the Universalist ministry at an early age. He was pastor of several Universalist societies in Maine, and is held in affectionate remembrance by many of his former parishioners wherever he was called upon to labor for humanity. Removing to the West, he continued his ministerial labors in various sections, being finally called to Sycamore, Ill., where he remained until 1869, when he resigned his ministerial work. For the next eleven years his home was Sheboygan Co., Wis., finally removing with his family, for the last time, to Traverse Co., Brown's Valley, Minn., in 1881.

Since 1880 Mr. Barrett has been interested in reform work of various kinds, but has devoted nearly his entire time for many years to the question of planting and preserving the forests of the West, particularly in Minnesota. Upon the reorganization of the Minnesota State Forestry Association, eight years ago, he was elected its secretary and was still filling this important office at the time of his death. His zeal in this work outran his strength and may have contributed to his unexpected demise. During these years the Minnesota public has become familiar with his pen, for he has written many trenchant articles upon forestry topics and contributed very materially to the growing and intelligent interest in the northwest on this important subject.

Mr. Barrett took an active interest in politics, and early espoused the cause of freedom. His voice was heard with no uncertain sound

in behalf of the black men of the South, and when the struggle for freedom and the Union came, he was ready to do his part.

The famous Eighth Wisconsin Regiment and its war eagle, "Old Abe," interested Mr. Barrett, and he wrote its history, combined with a life of "Old Abe", at the close of the war. The proceeds of the sales of this work were generously donated by Mr. Barrett to the Sanitary Commission for the benefit of the sick and wounded soldiers. He had "Old Abe" in charge at the Centennial Exposition, in 1876. He was an earnest advocate of the education of the black race, and did all in his power to secure that needed reform. Mr. Barrett always sympathized with the poor and oppressed classes among his fellowmen. He felt that the millionaire was entitled to no special privileges because of his wealth and position; hence, he uttered a ringing protest against organized injustice with regard to the nation's money and the rights of citizens in every department of life. In 1889 Mr. Barrett was the candidate of his party for the office of lieut-governor of Minnesota and received a very flattering vote, nearly sixty thousand voters declaring themselves in his favor.

During his busy public life Mr. Barrett found time to engage in literary pursuits to no little extent. He was editor of "The Scholars Leaf" in 1849, and wrote constantly for the Universalist press for many years. He edited the Free Press (Eau Claire, Wis.) during the early part of the war.

He needs no encomiums of praise to add to the lustre of his fame His best record, his noblest monument, can be found in the pure upright, conscientious life that he led during his sojourn upon earth. Becoming weary of the struggles, vicissitudes and perplexities of life, he has lain down the burden of years to take a needed rest in spirit. His heart was large and his soul sincere. He loved his fellowmen, and sought to benefit them through his sincerity of purpose and devotion to principle. He was an honest, upright manly man, and has made the world better because he lived in it. A devoted wife, a daughter, three sons, five brothers and a sister survive. Pass on to thy rest, thou who hast overcome! Peace, peace, eternal peace, be with thee in heaven, and with thy loved ones on earth!

Mr. Barrett became a member of this society first in 1886, and thereafter his name is found continuously upon the roll. In 1889 he was elected vice-president for his congressional district and continued to hold this honorable position up to the time of his decease. As an earnest and faithful member of our organization he was in nothing lacking, never shirking a duty, but cheerfully and willingly always taking up and carrying forward with credit to himself and great benefit to our cause any work coming in his way. Of whom of our members can more than this be said? Of him it was ever most true that he lived "with malice towards none and charity for all." He will be sadly missed and mourned by our fraternity, with whom he served so truly. SEC'Y.

ANNUAL MEETING, 1898,
NORTHEASTERN IOWA HORTICULTURAL SOCIETY.

REPORT OF DELEGATE O. M. LORD.

The thirteenth annual meeting of the Northeastern Iowa Horticultural Society was held at Forest City, Ia., Nov. 30th and Dec. 1st and 2d, 1897. The state is divided into four districts, and each district subdivided into four districts. Each district has a director. The Northeastern Society is represented in the first district by J. B. Mitchell; in the second district by W. A. Burnap; in the third district by B. F. Ferris; in the fourth district by W. H. Guilford.

The program was completed with the exception of some papers not filed with the secretary, though not adhered to in its regular order. Mr. Mitchell, in a report from the first district, said: There was no nobler work than horticulture, but it was poorly paid, when such frosts occurred as had visited us this year. All fruits were in good condition and promised a large crop, only to disappoint us. Apples which bore heavily last year were not expected to bear this year, but the trees bloomed with no result. Crop conditions were peculiar, adjoining orchards giving contradictory returns. All the small fruits were similarly affected, promised well but yielded nothing in this vicinity. Near McGregor, the crop was small and wormy and rotted badly, selling from 25c to 40c per bushel. In Winnishiek Co. the crop was light, a few Wealthy bore one and a half bushels per tree and sold at a dollar. At Waverly the crop was good, though much fruit was imperfect. Duchess, Wealthy, Walbridge, Longfield, Kaump and Patten's Greening did well; Allen's Choice, and Hibernal failed. In the eastern part, Montmorency and Morello cherries were fair; also plums, currants and gooseberries, grapes, strawberries, raspberries and blackberries were abundant and good.

Mr. Mitchell, upon request, illustrated and described his new apple seedlings, expressing great confidence in their future. Seed planted in 1863; trees nearly all winter-killed; named and selected six Cresco, Red Warrior, Lawrence, Ness, Quince and Duchess No. 4. In yield, size and appearance, productiveness and character of tree they compare favorably with the best grown here.

Mr. Burnap, district No. 2. All fruit returns for 1897 were small. Apples set but few buds, and were injured by frost; cherries bore lightly and were taken by robins; grapes did not bear; strawberries one-quarter crop; raspberries and blackberries nearly half a crop. All kinds of fruit trees and plants have made fine growth and gone into the winter in good condition.

Report from the third district. Mr. Ferris indicated that nearly the same conditions prevailed as in the first and second district.

In the fourth district, A. H. Guilford, representing the southeast part of the district, said, "Dubuque County had this year 30,000 bushels of apples, 5,000 of which were sold in the city from 40 cents to $1.00. Wealthy, Transparent and Willow were in the lead; next, Haas, Fameuse and Fall Orange, Autumn Strawberry and Duchess. Two orchards produced 2,000 bushels each. There are no regular commercial orchards, and the varieties are mixed and numerous. Peaches

were killed. Plums half a crop—500 bushels were sold in the city. Choice natives, like Wolf, Hawkeye, Wyant and Rollingstone, were not in the market, and inferior wild ones sold as low as 40 cents per bushel. Choice natives would readily bring from $1.50 to $2.00. Miners were one-third crop and small in size.

Cherries one-third crop; 350 bushels marketed. Richmonds sold at $1.00, later ones at from $1.50 to $2.00.

There are in Dubuque Co., 1,700 acres of grapes. The crop was short, one and one-half tons per acre, total 2,500 tons. One grower obtained forty-five tons from fifteen acres. There was made 600 barrels of wine, and 300 barrels from native wild grapes. Wild grapes sold at better prices than Concords. Concords lead in quantity, but Delawares and Brightons bring better prices. Moore's Early in large lots sold at six cents, Concords at one and one-half cents.

Red raspberries were a short crop, and 2,000 cases were sold in the city and 3,000 in the country. Blackberries were injured by drouth; 4,000 cases were sold. Strawberries a poor crop and low prices; 6,000 cases were sold. Conditions were not favorable to small fruit. There is a good opening for commercial orcharding along the river bluffs. Tiling, irrigating and subsoiling will pay. The problems to solve are, where to plant, how to plant, cultivate and market. The man who would succeed must study successes and failures in his vicinity, and the man who plants without study and advice is like him who conducts his own case in court. He has a fool for a client.

Tuesday evening, address of welcome by the Mayor and response by Mr. Burnap were felicitous, and well received and appreciated.

Paper by Mr. Kenyon of McGregor. "A Reminiscence, and a Look Ahead." Had forty years experience in fruit raising; compared early trials with those of later years. Success had been attained with quantity, but quality was lacking. In 1896 prices were too low for profit, in 1897 quality not good, many rotting on the ground. Prices did not justify gathering. He was forced to the conclusion that in Iowa a mistake had been made in trying to raise any of the improved or domesticated fruits, such as apples pears, cherries and also plums, except the natives. Better returns could be secured in other pursuits; could sell a pig and buy supplies of fruit for the winter. Horticultural products were cheapened by late methods of cold storage distribution and centralization of labor, and chances were too many against success by the average farmer. This paper drew out a storm of criticism, and found no one to indorse its statements, and they were flatly contradicted on every side by evidences to be seen on many Iowa farms.

Paper. "The Mission of Horticulture," by E. M. Sherman, Charles City. It is not confined to apple growing, it includes fruits and flowers; it has to combat many prejudices to compare results, to labor for the future and to hope ever; fifty years hence may see present varieties discarded. A close study of nature's laws advised, wild flowers and vines and fruits recommended for trial.

Its mission is to broaden the mind, to ennoble all the faculties, to give pleasure, and profit, and compared with grain raising, is much more desirable in securing and perpetuating a love of home life.

Wednesday morning, President's Address, Eugene Secor, Forest City. Horticulturists are home builders. They are not prompted by love of money, but by love of the useful and the beautiful, to clothe land with all that contributes to our pleasures and happiness by adapting the bountiful provisions of nature to our own use; and though we have met with wonderful success in the past, when contrasting the wild fruits and flowers of the past with those of the present, there is much yet to be accomplished. Faithful records must be made of successes and failures; that the necessary information can be had for future work.

In nature the birds scatter the seed as of old and the bees with pollen perform the marriage ceremony, but we must learn the secrets of nature's ways to bring the millennium of better, healthier food and more enjoyments of life. Horticulture is the product of civilization. No barbarian cultivates, wild fruits do for him, and as they were before we came, we do not go beyond nature's limits in their study and improvement. This is the purpose, end and aim of our society, adding to present knowledge and looking to the future with hope.

Delegates presented their credentials from the Northwestern Society, from Wisconsin and from this society, and were elected as honorary members—Mr. Clemens, from the Northwestern, Mr. Coe, from this. Mr. Dart and Mr. Wedge were also made honorary members.

Paper. "Our Apple List," Elmer Reeves. List not satisfactory; no late one made; a full descriptive list very desirable. Discussion.

Mr. Burnap would have a committee to give such a list. Mr. Dart would accept lists of nurserymen that grow their own trees. Mr. Guilford said nurseries sell anything, grown anywhere, from Mexico to Minnesota. Would not consult nor trust any nurseryman's catologue, would deal only with honest men in tree planting. Lists adapted to one locality, useless in another; consult those who have experience. Cresco, Iowa Falls, Albert Lea, &c, good places to buy trees for northern Iowa.

Paper. "My Work in the Orchard," G. A. Ivins, Iowa Falls. Allows no slip shod work; skill essential. Fruit includes apples, cherries and plums. Cultivates till August. At 12 or more years of age fertilizes, heavily; cannot be too rich for plum trees. Prunes carefully a little each year. Finds the best results from early spring pruning. Prunes cherries same as apples, painting the wounds. Small fruits between the trees; uses protector when small; has no experience in spraying; cultivates shallow. For curculio depends on shaking and chickens; digs up for blight. Commercial planting a good investment. Wragg cherry the hardiest early, long lived; quality good. Cleans out rotten spots on trees with a knife and applies grafting wax. Discussion. Mr. True would only prune in June; cover with wax.

Paper. "Commercial Orchards for the Northwest," J. S. Trigg, Rockford. We have no long keepers of good quality. Best fall fruits the only dependence. Wealthy first. Top-grafting will secure longer life. Many conditions involved in a commercial orchard:

site, soil, culture, protection, gathering, marketing; requires special fitness. Elevated land the best; blue grass a deadly foe. One orchard in Cerro Gordo Co., of only two acres, sold in one year $1,275 worth and seldom has failed to return $100 or more per acre. A large nursery firm reports as planted last year 17,514 trees: Northwest Greening, 4,000, Longfield, 2,000, Patten's Greening, 2,000, Wealthy, 1,900, Malinda, 1,700, Hibernal, 1,500, McMahon, 1,300 and others down to 50 Ben Davis. Northern Iowa in the future will be noted for fine fruit.

Paper. "Hard Facts as to Hardiness of the Apple." Thos. Frankland, Stonewall, Manitoba. Theories on isothermal lines, rarified air, resistence to frost, sap ripening, etc. afford some hints as to hardiness, but *trial* is the only means to determine results. Have tried 100 varieties of Russians, a large number of seedling crabs, etc.; results, *disappointment* in many cases. A few Transcendent, Hyslop, Tonka and Gideon's October fruited. Some seedlings of his own promise well; apples not large but of superior quality.

Wednesday afternoon. "Horticultural Reminiscences," W. A. Burnap. Trees found 100 feet beneath the top soil, placed there before or with the drift of ages ago, show that the present flora is very similar. Drift conditions, however, changed the character of our flora materially. There is a wide difference between that of Clear Lake and Mason City. Clear Lake soils stand more rain and more drouth than most soils. Where wild fruits are indigenous is found the best basis of success. The first apple trees set here were in 1858. No trees remain of those then set. Afterward he set a small nursery at Forest City; could not induce farmers to buy home grown trees, but they bought of an agent $25,000 worth in one spring, which all proved worthless.

Paper. "Glimpses from the Road Side," P. F. Kinne, Storm Lake, Pres. N-W. Society. Trees and shrubbery indicate whether this is a home or only a place to stay. Under the snow conifers are the most striking; Scotch pine not so good as Austrian at the end of twenty years; Norway spruce very fine; Colorado blue spruce fine; Black Hills, perfect, no defects, the coming tree. Red cedar, doing well; arbor vitae failing; also Douglas spruce and hemlock; Teas' weeping mulberry successful; Japanese wineberry departed.

Yellow Transparent appears well; Tetofsky not so good; Longfield needs further trial. Duchess is the apple; Haas has great vitality, big trees, but not regular bearer; Kaump has come to stay; Arabscoe good; Revel Pear good size, high quality, sweet; No. 169, Ben Davis, Antonovka, Hibernal, St. Lawrence, Plumb Cider, Walbridge, all doing well; Rawle's Janette and Perry Russett do well in favorable places.

Paper. "Norway Maple," Mr. C. Wedge. The life of ornamentals is very short. If soil is not adapted to them the best natives succumb. Northern Maple stands better than many other kinds; have stood for twelve years where birch and poplar died; better in Mower Co. than hard maple; trees twenty-five years old at Albert Lea. Mr. Mitchell had in 1844 maples all killed to the ground but grew again and are now fine trees. Do not succeed at Owatonna. Mr. Guilford planted 600, all gone; one species, the scarlet, does well. Mr. Coe has trees

twenty years old in Wisconsin; fine. President Secor twenty years ago set fifty of different kinds. Norway freezes down every winter; red maple fifteen years old only three feet high; brought sugar maples from N. Y.—they do not stand here. Some from this vicinity stand well. Mr. Mitchell's native maples grow well but yield to drouth; mulberry and catalpa kill to the snow line.

Wednesday evening the society was entertained by the citizens of Forest City. Music was alternated with recitations, given in an artistic manner to a highly pleased, large audience. Mr. Thompson, an early settler, gave an entertaining sketch of some of the incidents peculiar to pioneer life, contrasting the hardships and struggles then with present facilities for making a living.

Thursday morning. Paper. "Some Insects Which Threaten the Fruit Industry of Iowa." Prof. H. Osborne. This paper was a scientific description of various insects, and their history and habits The San José scale was the most important, it spreads rapidly, producing living young four or five generations in a season; the progeny of one insect may reach in one season the enormous number of 1,608,040,200, and it feeds on a great variety of plants, and forest and fruit trees.

Prof. Budd's paper recapitulated the work of the college in propagating and distributing various fruits and shrubs which, from reports, could be shown to have been of great value over a large area of the country, giving the names of varieties that were particularly adapted to different places.

Mr. Guilford's paper, on result of experiment station at Dubuque was confined mostly to ornamentals adapted to that district, naming successes and failures. Some of the papers on the program were not on file with the secretary.

Thursday afternoon: Paper. "A Few of the Mistakes of Nurserymen and Patrons," by R. P. Speer, Cedar Falls. Apples required five or six years for returns, and every ten or twelve years the grafted American apples on the drift soils have been injured by unfavorable climatic conditions. He would stop root-grafting and resort to top-working. Select good stocks, not Duchess nor Tetofsky, but Soulard, Virginia and Whitney and some Russians. These will stand when all root-grafts are gone. No winter varieties are grown as root-grafts that have good quality.

Members that discussed this paper expressed the highest personal respect for Capt. Speer and credited him with doing a large work for the fruit interests of Iowa, and regretted the appearance of his paper, as the facts would not justify his statements nor his conclusions. His choice of some stocks was ridiculed as utterly worthless for top-working or grafting in the root, and, finally, the whole discussion would lead one to infer that the paper was headed wrong, and instead of the mistakes of nurserymen, etc., should read "The Mistakes of Captain Speer."

Reports from the secretary and treasurer indicated that the society was in a strong, influential, healthy condition. The election resulted in the re-election of the old officers and board of directors, with one exception. The next place of meeting is to be at McGregor.

LYMAN'S PROLIFIC CRAB.

This valuable seedling originated at Excelsior, Minn. on the farm of Henry M. Lyman. A very small cut of the tree is shown, but it is, indeed, a large tree and so loaded with fruit that its branches trail on the ground, the crop that season amounting to twenty bushels.

A RISING HORTICULTURIST.

Another of the products of this farm appears on this page, of which Mr. Lyman is justly proud, being his oldest grandson, of whom he expects to make a "bred in the bone" horticulturist.

Mr. Lyman all too modestly describes his seedling tree, which, by the way, is only one of a large number of seedlings bearing on his place.

The seed is from the Haas crossed with Siberian crab. It was planted in 1868. The tree now measures thirty-four feet across, while the body is forty-two inches around. It is an annual bearer and free from blight. In size of fruit, it is like the Whitney. It

LYMAN'S PROLIFIC CRAB.

bears very young, often in the nursery row at three years of age from the graft, and produces enormous crops ranging from ten to to twenty-five bushels annually. The fruit is well colored and very firm, bearing handling far better than the Transcendent, these qualities making it a valuable market apple.

PROTECTING TREES FROM JACK RABBITS.—Jack rabbits have been very numerous and destructive in Meade county this season. Heretofore I have wrapped the trees or whitewashed them for protection. This fall I put on the whitewash, but a continued wet spell took it off, and the rabbits damaged several trees. I was killing rabbits for chicken feed at the time and had half a dozen on hand when I noticed the damage. I skinned a rabbit, cut off the hind quarter and rubbed the remainder on the tree, and continued until the flesh was pretty well worn off. I followed this with the quarters until the whole rabbit was used up. I treated all the apple trees on the farm in this manner, and the method seems entirely successful. It is cheap and easy of application, one rabbit covering about 150 trees, the trees being two to four inches in diameter, with short trunks.—E. D. Smith, Meade County, Kansas.

THE FIVE P'S: PANSIES, PETUNIAS, PHLOX, PINKS AND POPPIES.

MRS. O. C. GREGG, LYND.

"The melancholy days have come, the saddest of the year,
Of wailing winds and naked woods, and meadows brown and sear."

And now that the flowers have gone for the winter, and we have none to enjoy except the few that we have gathered to our firesides, and nothing to inspire us but the brilliant coloring of the florists' catalogues, it seems a sorry time to write up our own favorites—but we are called to give the good qualities of only five, so we cheerfully set ourselves to the task.

Pansies, petunias, phlox, pinks and poppies,—rich, profuse, varied, sweet and showy. How glad we have been to call them our friends, and how many of our homes have been brightened by them, how many occasions enhanced by their decorative possibilities!

Could anything be more rich than the pansy, more profuse than the petunia, more varied than the phlox, more sweet than the pink or more showy than the poppy? They should never be omitted by the farmer's wife in making up the list of seeds to be sown for the summer's bloom. They will brighten her garden from early summer till frost, so that she will not regret for a moment her seed sowing, but be glad that a little time was snatched from her busy hours to put them in place where they will cheer and divert her. Pansies on account of their richness will make her think of the wealth of Ophir and the royal glories of kings palaces; they might also suggest at times faces of friends or acquaintances, for each plant has a distinct individuality suggestive of personal characteristics in the people about us. Petunias will delight her on account of the variety of their colors and the profusion of blooms they will yield—all faithfully and lavishly given from day to day, reminding her of common, every day, reliable people, who are never too busy to be kind. Phlox will give endless variety in color and shadings and make some spot gay with their brightness. Pinks, a large and interesting family, dainty, rich, sweet and bright, will prepare themselves to decorate the cosy nooks of her home and give an added grace to her festive board; while poppies will glorify with their brilliancy an otherwise dark or forbidding corner in her garden.

I have often wondered why so many farmers' homes are without flowers—sometimes even without trees. May it not come from imagining that the beautiful must be sacrificed for the useful? Yet should it be so? Beauty has its mission. It comes with power to cheer, refine and elevate. Perfection of any kind is inspiring, and in no way can we gather about us beauty and perfection in so great a degree as in making a place for flowers. Make way for them then in every nook and corner! Let them climb upon your porches, run up your windows and brighten your lawns! And, my word for it, you will live a brighter, purer, higher life in consequence of their benign influence.

One might at least grow our five p's, for the seeds are cheap, and the plants are easily cultivated.

While jotting down the few thoughts my subject suggested, it occurred to me that our worthy secretary must have had some reason for choosing these five commonplace flowers, and I tried to find the reason in their characteristics. How often do we learn lessons from our silent teachers. Wordsworth says:

"I deem there are powers
Which of themselves our minds impress,
That we can feed this mind of ours
In a wise passiveness."

I think that in our "Five P's," we can find five characteristics, which, if wise, we may sow in our heart's garden: Patience in the pansy, since it must wait so long before unfolding its richness; profuseness and persistency in the phlox and petunia, because of their generous and continuous bloom; permanency in the pink; and philanthropy in the poppy, because of its diffuseness. Indeed, if I were called upon to give an antidote for a poor, proud, peevish, passive, purposeless farmer's wife or daughter, I would recommend her to take our "Five P's" to her heart and make them her daily companions, and I would almost guarantee that if she is susceptible to their teaching she will become *pleasant, plucky, patient, practical* and *persistent.*

BEST FIVE VARIETIES OF GRAPES FOR HOME USE.

GUST. JOHNSON, EXCELSIOR.

I have been requested by your secretary to write a paper on the best five varieties of grapes for home use. I find it not an easy task to do this, doing all varieties justice, taking the different soils and locations into consideration, because there are so many good kinds to select from, but few which will thrive everywhere—neither is there one which is not a success in some locality. As one has said, to praise a grape or condemn it because it is not a success in one's own vineyard, only shows inability or unwillingness to see beyond one's own garden fence.

I would say in the beginning that I have come to my decision on the following five kinds: Brighton, Lindley (Rogers No. 9), Moore's Diamond, Moore's Early and Worden—two red, one white and two black grapes, which I think will be hard to improve upon for this locality or state out of varieties which have been tried and tested for some time. There are new kinds introduced every year claiming to be better or an improvement, but few of which seem adapted to any wide range. Surely, these five varieties have some faults, still they have so many good points that I would put them at the head of the list for home use. I will state why I think so for this state. I think early ripening and hardiness outside of lake influence are two of the main things necessary for success, and productiveness, health and quality for home use without the special culture or extra care which some of the other kinds need to be a success all of which qualities I think you will find in the five varieties named.

I will give a description from other sources, viz: Bushberg catalogue, which I think explains it better than I can, and add to it what I have found out about them at my place and others. I believe if one goes to work and plants these five kinds for home use, they will have the best that can be grown in this state, taking all things into consideration which make up a grape of good quality and hardiness and health. These last years the grape seems to have taken a back ground with growers for market on account of low prices, but it ought not to hinder any from planting grapes for home use, because there are not many kinds of fruit more healthful for the family than grapes of the best quality for the table. A grape vine well trained is a thing of beauty to look at, and the fruit good and refreshing to eat out of hand.

Brighton. This handsome and fine grape is a cross of Concord and Diana Hamburg; a hardy, rapid and vigorous grower, with medium to long jointed shoots, which ripen early; very productive. If the small bunches were taken off early in the season, it would be a great benefit to the others; sometimes, however, its flowers have stamens with curved filaments and do not always fertilize, though blooming abundantly. It should, therefore, be mingled with other varieties growing close by which have the same time of blooming. Bunch, medium to large, shouldered moderately compact; berries, medium to large round, light red at first, changing to a dark crimson or maroon when fully matured, sometimes almost black; lilac bloom, and very good quality for an early grape. It has its best flavor when fully ripe. It ripens before the Delaware. In the eastern states it is a leading table grape. It requires protection in winter and is subject to mildew. It cannot be called a good keeper, as it does not retain its fine flavor long after maturity.

Lindley (Rogers No. 9). This beautiful and valuable grape originated by hybridizing the wild mammoth grape of New England with the Golden Chasselas. Bunch, medium long, shouldered somewhat loose; berries, medium to large, round; color, quite peculiar and distinct from any other variety, rather more of a brick red than Catawba color; flesh, tender and sweet, scarcely a trace of pulp, and possessing a peculiar, rich, aromatic flavor. It is regarded by some as fully equal to the Delaware in quality. Roots, long and straight with smooth fibre of medium firmness; canes, slender for their length, with few laterals and large, prominent buds; vine, of very good growth, healthy and sometimes productive, making rather long-jointed wood, medium in hardness and size of pith. The fruit ripens very early and keeps without extra care till the first of January. It is recommended as a fine table grape, one of the best of the red hybrids, but it should be planted near other varieties blooming at the same time to insure its perfect fertilization.

Moore's Diamond. Originated from seed of Concord fertilized by Iona, in 1873, in New York state, where it has grown and fruited ever since and endured the winters uninjured and without protection, but it has to be protected in this state. The vine is a vigorous grower and productive, perfectly maturing its wood and retaining its foliage, which is large, of a dark, glossy green, resembling its

parent, the Concord. The bunches are large, handsome, compact, often double-shouldered; berries, of full medium size, adhering firmly to the stem; color, a delicate greenish white, with yellow or amber tinge when fully ripened; flesh, tender, with few seed, juicy, sprightly, sweet and refreshing; skin, thin, nearly transparent, yet sufficiently tough to bear packing or handling well; quality, very good, superior to other hardy white grapes. The fruit ripens at least a week before the Concord. Some of the best judges consider it the best white outdoor grape we have.

Moore's Early. It could not be better described than by calling it an early Concord. Bunch smaller and rarely shouldered, but the berries are the same but larger. It is in similar soils and localities as healthy and nearly as hardy as its parent, though not as productive or vigorous. It is almost equal to the Concord in quality, but ripens ten days to about two weeks earlier. Its large size and earliness render it desirable and make it a popular market grape, and it has been largely planted. It needs careful cultivation and liberal manuring. It has been awarded first premium at many horticultural exhibitions. On rich ground this variety bears well. Some recommend pruning it to long spurs to make it do its best.

Worden. This variety was raised from Concord seed, and it has very nearly the health, vigor and productiveness of the parent, whose place it is gradually taking in some localities. It has some tenderness of skin, softness of pulp and poor keeping qualities which render it difficult to ship successfully to market, otherwise it might even supersede its distinguished parent. In character and appearance it is like its parent, only a few days earlier in ripening, and in quality distinct from Concord, with a peculiar, superior flavor. Bunch, large, compact, handsome, shouldered; berry, large, black; skin, thin; flesh, sweet, much like Concord, but generally regarded as a better grape. It seems less subject to rot than the Concord. It is now very popular and largely planted in vineyard and garden. This is a grape that cannot succeed in all places. At Minnetonka it doesn't ripen even in some places, but at my place it has been a success so far. It seems to prefer a warm, sheltered location. It drops its berries in some places from mildew, like last summer, when it was raining so much. Another thing, one has to be sure of getting the true Worden, as there are many spurious kinds sent out. I received some Cottage in place of them, which variety is much smaller and ripens unevenly, some berries being green when others are ripe. Be sure you have the Worden and take care of them, and you will have a fine grape for home use.

CUCUMBERS.—Don't plant cucumber seeds in a pan or wooden box, if you start them in the house this spring, as the plants are thus liable to be much injured in transplanting. Much better results will be obtained by using small pasteboard boxes, putting but a few seeds in each, and tearing the boxes to pieces when the plants are set out. This leaves the earth in a little compact mass about the roots, and the plants will hardly know when they are taken out. This is a good idea for any plants that are to se set out. In fact there is a patented paper box used, involving the same idea.

ANNUAL MEETING, 1898, WISCONSIN STATE HORTICULTURAL SOCIETY.

CLARENCE WEDGE, DELEGATE, ALBERT LEA.

The opportunity of making a visit to my native state after an absence of more than twenty years was greatly appreciated by your delegate; and remembering the first visit which I paid to my grandparents in that state, away back in the sixties, when there were no railroads this side of the Mississippi and it took us nearly a week to make the trip, it certainly brought a fresh realization of the comforts of the present day to take a comfortable, steam-heated coach at 6:30 p. m., at Albert Lea, and be waked by the nudge of the brakeman in Madison long before daybreak. But, come to think it over, have we not made almost as great progress in horticulture the past thirty years? We do not appreciate what a fruit country we have developed until we compare the list of apples, plums, raspberries and strawberries then planted with the rich and safe varieties that we have today. But we digress.

Arrived at the capital, the first familiar object that greeted us after wending our way through the maze of halls and staircases to the fruit room of the society was the benignant countenance of our Minnesota plum oracle, Mr. O. M. Lord, with his cabinet of plum pits. It has been my good fortune to have had the company of this veteran horticulturist at both the meetings I have attended outside the state the past winter, and I feel impelled to say that no one need feel ashamed of our horticultural society when Mr. Lord is its representative, and that no attendant at any meeting is listened to with more evident interest and respect. It seems that in this case he shared with Prof. Bailey, of Cornell, the honor of being specially invited to be present and instruct the membership in their special lines.

The Wisconsin society has an individuality all its own. Although naturally a better orchard region than either northern Iowa or our own state, small fruits appear to hold a queenly sway over their councils, and the weight of woe that was unburdened as reports were given of failure of prices seemed almost equal to our own trouble in regard to the failure of crops. Which is the greater of the two evils may well be doubted. I cast about to discover who was chief helmsman of their ship, or, as Brother Dartt would say, who was "king." President Kellogg seemed to hold a mild and quiet sway, and if, in truth, he be the man, I doubt if his subjects are fully aware of it. The elections passed off as calmly as possible as regards the principal officers, but the better part of half an hour was spent in balloting for a man to fill a place on some committee work. Dartt and Philips had their usual passage at arms, in which I shall have to acknowledge that our champion had rather the worst of it. However, on his home grounds I have little doubt that the result would have been reversed. Prof. Bailey's lecture on "Conditions Favorable to the Formation of Fruit Buds" was the star attraction of the meeting and was eagerly listened to by an audience that filled every seat in the senate chamber. There was not much in it

that was strictly new to well posted orchardists, but the subject was handled in a broad manner that would furnish food for thought and from which special plans might be worked out. Like Prof. Fernow, who visited our society some years ago, he has a gift of tongues that is not commonly found in the man whose hands show the callus of the pruning hook.

I looked to find the man of one idea, one "best thing on earth" and that in his own exclusive possession, the man who never opens his mouth but to pronounce it, but, strange to say, he was not there, and, stranger yet, they seem to get on and run a horticultural society without him. And then the man who bobs up and spends a long time saying nothing on every subject that comes up seemed to have been detained at home by an attack of the grip or some other merciful disease.

The show of apples was superb for the time of year, Waupaca Co. making a particularly strong exhibit. It was the pleasure of your delegate to act as judge, and he made liberal use of his prerogative to discover the fine flavor of Wisconsin apples. The old American varieties, like Fameuse, Seek-No-Further, Tallman, &c., with the addition of Northwestern Greening, McMahon and Wolf River, seem to be enjoying the popular favor just now. When I was called upon to give my ideas on "Planting and Caring for an Orchard," I felt like a boy before a board of examination. I saw in a moment that it would never do to talk Hibernal to that audience, or the idea of planting an orchard on the narrow gauge plan. I could not, like Philips, tell stories or, like Underwood, sing a song, and all my set phrases and stock ideas seemed to be out of place. How I managed to cover up my utter confusion and find my seat amidst applause is all due to the patience and good nature of that amiable society.

The Wisconsin people do so much of their routine business in open society that, even with a short program, there was scarcely time to do full justice to the real horticultural topics, and we discovered that there is a distinct "advantage" in the Minnesota plan of using the society for horticulture and the executive board for business.

We append a few short notes:

J. C. Plumb, of Milton, is preparing a history of Wisconsin horticulture.

Jonathan Perriam, of Illinois, says that the American plum brings a higher price on the market than the California.

Mr. Hardin finds the Whitney as a stock for top-working generally outgrown, and varieties seem more inclined to blight on this stock.

The Yellow Transparent is strongly recommended as a profitable early market apple.

J. C. Ferris, the Iowa delegate, has found that soils will make a difference of two weeks in the ripening of apples.

F. H. Chappel, of Oregon, Wis., would whitewash fruit trees quite generally to promote hardiness; apply in the fall.

Mr. Richardson reported that in his section not less than 10,000 crates of strawberries rotted on the ground for lack of market.

Mr. Coe: "Raspberries netted us about 7c per quart."

Dr. Loope: "The acreage planted to blackberries seems to be decreasing."

Mr. Barnes, of Waupaca Co.: "The old plantations of blackberries have been largely killed out by winter drouth. Crop of cherries fine, apples moderate crop, of choice quality. It pays to cultivate the home market."

Stickney, the currant king of Wauwatosa, near Milwaukee, was unable to market all his crop. Proposes to improve the quality of his berries by putting about twice as much work on them. Prince Albert, his best variety; L. B. Holland, second best. From a short test of the Wilder currant is very favorably impressed with it. White Grape useless for market but the best for family use; its high quality and habit of holding its fruit a long time after it is ripe especially commended. Gooseberries are the hardest fruit to market when there is a general surplus. People should be educated to appreciate that as fine a sauce as is made from green gooseberries, a choicer can be made from the ripe fruit.

Pierce Co. people (north Wisconsin) were willing to talk with your delegate on the Russian apple list.

We hear much of Newells, McMahon, Wealthy, Fameuse and Windsor apples. Mr. Hatch says the McMahon will prove itself worthy of Minnesota planting.

O. M. Lord commends the high quality of the Wyant and Surprise plums.

With the exception of vice-president, all the old officers were re-elected.

Appleton is likely to be the next place of summer meeting.

Society decides to maintain an exhibit at Omaha for a month or more, $500 being appropriated by the society and $1,000 expected from the legislature.

A. G. Tuttle, now over eighty-three years old and as bright as many a man of half his age, was in attendance and took an active part in the proceedings.

The show of new seedling potatoes, originating in Wisconsin, was wonderfully fine and very interesting—an industry that would seem well for us to foster in a state that grows as many potatoes as Minnesota.

The bulletin on native plums just sent out by Prof. Goff is one of great practical value and should be in the hands of every progressive fruit grower in our state. (Address Prof. E. S. Goff, Madison, Wis., for a copy.—Sec'y.)

SUNFLOWER SALAD OIL.—Dr. Wiley, the chemist of the Agricultural Department,in Washington, says that in his opinion the coming salad oil will be made of sunflower seed. It is a perfecf substitute for olive oil and will be very cheap.

HOW THAT 1000 MEMBERSHIP MARK MAY BE REACHED.

A. K. BUSH, HORTICULTURAL LECTURER AT FARMER'S INSTITUTE.

Personally I am very anxious to extend the usefulness and field of the Minnesota Horticultural Society. Knowing this can be best accomplished by securing *new* names for membership, I have given the matter a little extra time and attention during the past year, and succeeded in securing about fifty additional subscriptions.

Now, I do not mention this as an egotist or with any thought of "see what I have done," but wish to call attention to what *you can do* in helping along this "new gospel" of fruit growing and tree planting, which we want preached all over our state, and to *every* person, until plantings shall be made on every farm and home grounds in Minnesota in such quantities that every family may use *home grown* fruits in abundance as an all-the-year-round food. This would give good health, add years to our lives, and save "store bills," etc., also help make the home self supporting.

With such thoughts in mind and a desire to place the best instruction in fruit growing known in our state in the hands of my friends, I show them the generous and valuable combination offered by our society to new members. In addition to all the other society's helps for the year, each member has the cloth bound report of 550 pages, a live, up-to-date monthly magazine of 40 to 50 pages, also Prof. S. B. Green's Amateur Fruit Growing, a book of 130 pages, containing the *best* practical information known to the northwest planter and grower of fruits. Wherever I can place this combination, which costs only $1.00, I know some family is started or helped on the road to successful fruit growing.

Now, a suggestion to *every* member of our horticultural society: With a supply of the magazines and fruit lists, which, if you do not have, can be had of Secretary Latham, also a copy of the report and Amateur Fruit Grower, go to the *next* annual town meeting in the morning and stay all day, *vote right*, then do not squander time and effort in "discussing politics," but make a *business* of securing new members to the Minnesota Horticultural Society. "Work" other public gatherings in the same way—I can assure you it is no "mean business." You will be surprised when you learn of the general interest in the subject, and how easily and readily they come down with the dollar and their name. Let's all unite, prepare for this "push" and surprise our worthy secretary by passing the "1000 mark" in 1898!

N. B.—The society does not offer Green's "Amateur Fruit Growing" as a premium to new members, but it does offer this valuable work as a premium to old members for securing new ones, and Mr. Bush has adopted the commendable practice of giving to the new members this premium, which, in fact, is *his own premium.* This plan may well be pursued by our members in increasing our membership, especially after one has secured a single copy for himself. The society does, however, offer three plant premiums, valuable to new members, of which Mr. Bush does not speak. See list on inside page of front cover of this magazine to select from. *Sec'y.*

FARMER'S FRUIT AND VEGETABLE GARDEN.

A. K. BUSH, LECTURER ON HORTICULTURE AT THE MINNESOTA FARMERS' INSTITUTE.

The accompanying sketch is substantially as used by Mr. Bush in connection with his institute work.

To best understand the value of this garden, plant and cultivate as suggested by plat, and test its possibilities of production and its economic values by using its products every meal as staple foods, which will add much to health, wealth and happiness, also save "store bills," doctors visits and money. Study the diagram carefully, and with good judgment applied you can grow the one-acre garden with but little more work than is required for an acre of corn, which is grown for the hogs—the garden is for your family.

Evergreens and other trees should be planted on all sides but the east, to protect from extreme atmospheric conditions, also to retain and conserve moisture, supplying a much needed "shelter belt" on the west or north, where garden should be located, extending this shelter to give protection on the north of the buildings. Order all trees and plants from some reliable nursery in our state, the nearer your home the better, planting such varieties as succeed best in your locality, and *nothing that does not appear* on the fruit, tree and plant list of the Minnesota State Horticultural Society. Spend no time or money on high priced novelties or with the "foreign tree peddlers." The best trees, plants and seeds are the cheapest.

Care of Nursery Stock.—When received all trees and plants should be unpacked as soon as received, in a shady place. Dig a trench one or two feet deep, make a mud bath with a hoe, using rich clay loam in water; soak the roots of all plants in this after opening bundles, and allow the same to remain in this trench well "heeled in" until the ground is prepared.

Planting.—Take a moist or cloudy day for planting, keeping the roots in the shade or mud bath while planting. Sunshine is *death* to the roots of trees, especially evergreens. Open wide and deep dead-furrows with an iron beam plow, working soil as deeply as possible by repeated plowings, and mixing the surface and the subsoil thoroughly. Plant all trees in the bottom of the furrow, six to twelve inches deeper than they grew in the nursery. This will give a hardy root system from the stocks of the trees, also protect from damage by extreme drought and cold. *Deep planting secures long lived trees.* Work the soil carefully amongst the roots with a continual "churning" motion of the tree as the earth is filled in, packing the same so firmly with both feet that the tree cannot be pulled out. This rule applies to all tree planting. Do not fill the furrow, but cultivate *often.* This will secure and conserve moisture.

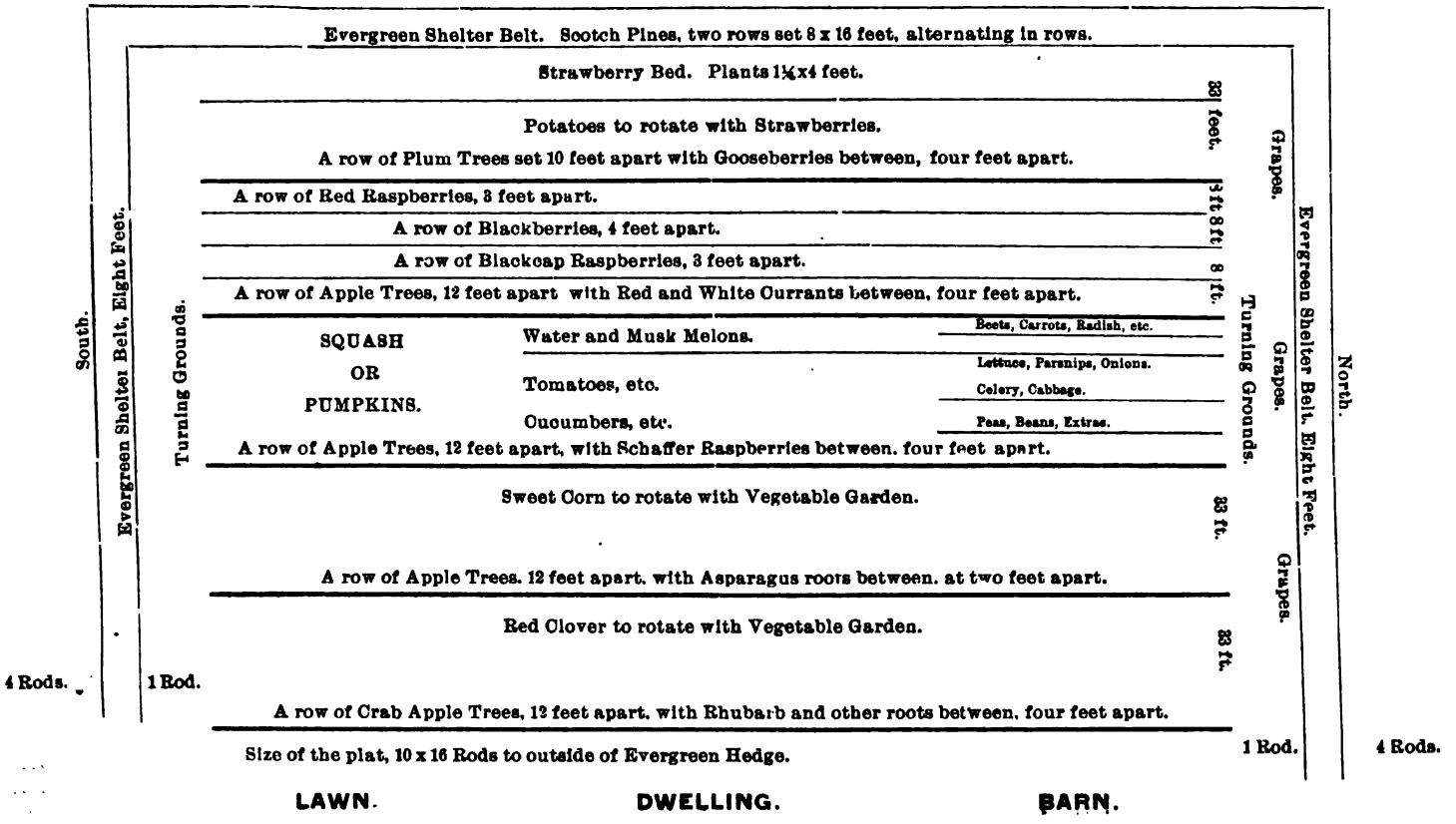
Small Fruits.—Berry bushes should be planted in shallow furrows, with earth firmly packed about the roots.

Strawberries should be planted in rows four to six feet apart; plants fifteen inches in the row, at least one-half of which should be staminate kinds, to secure perfect fertilization *and fruit.* Do not take plants from old or bearing beds—they are worthless. Strong

Willow Hedge or other trees for snow break.

(Two or more rows eight feet apart, and four feet apart in the row.)

DIAGRAM OF FARMER'S FRUIT AND VEGETABLE GARDEN.


Evergreen Shelter Belt. Scotch Pines, two rows set 8 x 16 feet, alternating in rows.
Strawberry Bed. Plants 1½x4 feet.
33 feet.
Potatoes to rotate with Strawberries.
A row of Plum Trees set 10 feet apart with Gooseberries between, four feet apart.
A row of Red Raspberries, 3 feet apart.
3 ft
A row of Blackberries, 4 feet apart.
8 ft.
A row of Blackcap Raspberries, 3 feet apart.
A row of Apple Trees, 12 feet apart with Red and White Currants between, four feet apart.
SQUASH OR PUMPKINS.
Water and Musk Melons.
Tomatoes, etc.
Cucumbers, etc.
Beets, Carrots, Radish, etc.
Lettuce, Parsnips, Onions.
Celery, Cabbage.
Peas, Beans, Extras.
A row of Apple Trees, 12 feet apart, with Schaffer Raspberries between, four feet apart.
Sweet Corn to rotate with Vegetable Garden.
33 ft.
A row of Apple Trees, 12 feet apart, with Asparagus roots between, at two feet apart.
Red Clover to rotate with Vegetable Garden.
33 ft.
A row of Crab Apple Trees, 12 feet apart, with Rhubarb and other roots between, four feet apart.
Size of the plat, 10 x 16 Rods to outside of Evergreen Hedge.
LAWN.
DWELLING.
BARN.
South.
Evergreen Shelter Belt, Eight Feet.
Turning Grounds.
Grapes.
Turning Grounds.
Grapes.
Evergreen Shelter Belt, Eight Feet.
North.
Willow Hedge.
4 Rods.
1 Rod.
1 Rod.
4 Rods.

vigorous plants, from a new setting, true to name, from a reliable grower, are best and cheapest. Do not allow any weeds to grow or seed upon land the year before setting—this will save hoeing; cultivate shallow and often, in one direction—this forms a dust blanket which conserves moisture and stimulates growth, also aids in forming matted rows; mulch *heavily* with clean straw between the rows, lightly on plants for winter protection. Lift the straw with a fork early in spring to admit air and sunlight to plants, which will then grow through a light covering, and protect the fruit from dirt and drought. Protect blossoms frosty nights by covering with straw mulch. You can grow strawberries for less than two cents a quart, and why not have them *in abundance*.

Plant berry bushes as diagram suggests, three to four feet apart, in rows eight feet apart, one to three plants in each hill. Pinch black raspberries back when fifteen inches high. Cover blackberries, raspberries and grapes with earth in October—you will get more and better fruit for the work.

Protection and Cultivation.—Fruit trees should be protected with wire fly netting, painted with thick paint, on the south side, to protect from sun scald, mice and rabbits. Burlap wrappings will do. Use *some* protection. Cultivate your orchard—it secures fruit. Mulch during fall and winter, spreading the mulch in the spring about the trees, again cultivating shallow until July, repeating every year, and apples will be as common and staple as potatoes upon your farm. I am growing them as a cheap hog feed, with surprising success, in Olmsted county.

Vegetables.—Note the rotation in the vegetable and strawberry garden. This is important. Sow clover seed with the sweet corn when last cultivated, allowing stalks to remain on the ground over winter for protection. Spread well rotted manure on the clover during the winter or spring; plow all under in June; cultivate or harrow during the summer to destroy weed seeds and prepare the ground for a vegetable garden next season. This means a well prepared garden soil, free from weed seeds; it also saves hoeing and weed pulling. Plant vegetables in large assortment, following early radish, lettuce, peas, etc. with late beets, parsnips, celery, etc. for winter use, getting two or more crops from same row,—testing the possibilities of a garden well arranged and cultivated with horse power.

Note the arrangement of rows in diagram. Small growing plants occupy one portion of the garden, with rows two to three feet apart; melons, cucumbers, tomatoes, etc. another section, with rows double that distance, and squash, pumpkins, etc. with distance between the rows again doubled, all of which aids cultivation with horses.

Do not fail to plant celery in a well prepared trench, using clean straw to blanch. Plant at least 100 asparagus roots between the apple trees, with soil made rich under the plants by using well prepared compost. Asparagus will grow as rapidly and surely as weeds in our state and supply a sun protection for the apple trees, also a luxury in great abundance for your family and neighbors for two or three months. Plant salsify, or vegetable oyster, and a lot of them.

They are almost equal to the "genuine" in flavor and more healthy, and can be kept in the ground during the winter, also in your cellar packed in sand. Plant sugar beets, mangolds or squash for stock, on land not required for the family garden.

Insect Protection—Protect all vines from bugs, frost, etc., by covering with boxes 8 x 10 inches, made of ship-lap siding, covered with a light of glass, a small hotbed, or cover sashes with cheese cloth painted with linseed oil, making the same transparent.

Destroy cut worms with one part Paris green to twenty parts of shorts, well mixed, scattered near plants.

Destroy cabbage worms with one part sulphur to 100 parts air slaked lime dusted on plants.

Destroy plant lice with kerosene and sour milk emulsion, two parts kerosene to one part sour milk, thoroughly mixed by churning or by shaking in a jug; add fifteen to twenty parts of water, and apply with spray pump or sprinkler.

Bordeaux Mixture: Two pounds of quick lime slaked in twenty gallons of water, and three pounds blue vitriol in two gallons water. Strain the lime mixture through burlap into the blue vitriol water mix and use with spray pump for all fungous diseases of plants and trees. Add ¼ pound of Paris green to this to destroy the codling moth and other insect pests.

Destroy currant worms, etc. with one ounce white hellebore in one gallon of water, and spray or sprinkle. Insect powder destroys nearly all insect life when applied with a powder gun, but it is expensive and frequently of poor quality.

Results.—One acre of your farm arranged, planted and cultivated as the diagram and directions suggest, will give some idea of the value and possibilities of a garden. My family is supplied with fresh small fruits nearly three months, with apples nine months of the year, and by preserving fruits and vegetables, which can be done so easily with Mason cans, our table is supplied nearly every meal during the year with some product of our fruit and vegetable garden, saving the expense of meats, often diseased, and many other "store" products, which cost money and are frequently entirely unfit for food. Plant this garden next spring and be convinced of its value.

To encourage the children, allow them to sell all surplus vegetables and fruit, and then to retain the money for their personal use.

N. B.—I wish to call the attention of our northwestern fruit growers and gardeners to the many helps and valuable suggestions which save time and money and many disappointments, as given by practical men of large experience, through the books, magazines and other publications of the Minnesota State Horticultural Society. Write A. W. Latham, Sec., Minneapolis, Minn., enclosing $1.00, which will give you a membership, the monthly magazine, a cloth bound report of 550 pages, and also several valuable plant premiums which you can select from a list he will send you. Also subscribe for our state farm journals. Often a single article or suggestion from these papers is worth and will save in time and money several times the cost of the subscription. If I had time

to read them, I would "take in" every farm paper published in the northwest, as an investment, knowing that I should get prompt returns in money secured through better and up-to-date methods of farming.

Suggested list of fruits to fill out the foregoing plan:

Fifty apple trees, viz.: 5 Duchess, 10 Wealthy, 10 Hibernal, 5 Longfield, 5 Malinda, 5 Tetofsky, 2 each of Patten's Greening, Okabena, Anisim, Repka Malenka and Kaump.

Twenty-five crab and hybrid apple trees, viz.: 5 Whitney, 5 Virginia, 5 Early Strawberry and 2 each of Hyslop, Minnesota, Sweet Russett, Martha and Dartt.

Twenty plums, viz.: 10 Desota and 2 each of Forest Garden, Weaver, Rollingstone, Wolf and Cheney.

Twenty grapes, viz.: 5 each of Concord, Delaware, Worden and Moore's Early.

Fifty currants, viz.: 25 Red Dutch, 10 Victoria and 15 White Dutch.

Forty gooseberries, viz: 20 each of Downing and Houghton.

One hundred red raspberries, viz.: 25 each of Cuthbert, Marlboro, Schaffer and Turner.

Seventy-five blackcap raspberries, viz.: 50 Gregg and 25 Ohio.

Fifty blackberries, viz.: 40 Ancient Briton and 10 Snyder.

One thousand strawberry plants, viz.: pistillates—200 Crescent, 200 Warfield and 100 Haverland; staminate—200 Bederwood, 200 Capt. Jack and 100 Parker Earle.

One hundred asparagus roots, viz.: 50 each of Conover's Collossal and Palmetto.

The above list can be secured of any nurseryman in the state, and *be wise enough not to buy elsewhere.*

IMPORTANCE OF WINDBREAKS.—Next to irrigation the most important topic for the consideration of farmers is the windbreak. In Oneida county, New York, there is an orchard of Red Astracans, one-half of which has a windbreak of arbor vitæ hedge and the other none. The protected part is in perfect condition; the other part is nearly dead, not a thoroughly sound tree in it. The crops show the same difference. At another place there are on one side of the street hedges and groups of evergreens, on the north and west; on the other side is an open sweep for the wind. The protected land ripens lima beans, Isabella grapes, and is as good as a whole degree of latitude warmer than the other. Our serious trouble is not from cold, but from cold, drying winds, and speedy changes of temperature.

I recommend evergreen screens everywhere; not only hedges but screens of trees allowed to grow tall without clipping. The arbor vitæ is generally best, hemlock in some localities. Norway spruce wants more room, but is valuable. The old plan of letting trees grow up on fence lines was right. Too much economy in clearing land is a mistake. The proper trees for windbreaks vary in different parts of the country, but this means of protection is very generally useful.—E. P. Powell, N. Y.

AMONG THE ORCHARDS OF SOUTHWEST MINNESOTA.

PROF. S. B. GREEN, STATE EXPERIMENT STATION, ST. ANTHONY PARK.

Mr. Clarence Wedge and I, each of us with his bicycle, met at Mankato at noon, August 23d. From there we took the train to Vernon Center and visited H. W. Nelson's place, which is about two or three miles from the station. Mr. Nelson's orchard was planted about twenty years ago and consists of Whitney, Wealthy, Duchess, Hibernal and Longfield. The trees of all varieties are now in good condition but look as though they had had a hard time. All bore well last year. The Duchess bore just as well this year, and the Whitney always bears. The fruit of the Hibernal ripens all at once and hangs on the tree better than the Wealthy. This farm has been rented to tenants eighteen years. The orchard has evidently been in sod most of the time and neglected.

From Mr. Nelson's farm we went on our bicycles to J. S. Parks,' a distance of nine miles. Mr. Parks' place is pleasantly located on gently rolling prairie, at Pleasant Mound, about eight miles from Amboy. It was evident from first sight that some one lived there who loved trees. Mr. Parks was formerly in the nursery business and has raised very many seedling apples. He commenced planting windbreaks and groves of many kinds of trees, including white elm, white maple, ash, white willow, cottonwood, catalpa, white pine, honey locust and black locust. The trees in the grove are large but, generally, too close. We measured white pine and catalpa ten inches through at four feet from the ground and thirty feet high; honey locust nine inches through and thirty feet high. All of these are sound and good except possibly the catalpa. The black walnut does well here. The black locust is badly injured by borers and has sprouted from the roots.

In the orchard, a part of which consists of trees left as they were in the nursery rows, we found quite a number of Wolf River trees that are sound and good. They spread about thirty feet and are nine inches through. Some of the trees of this variety begin to show signs of decay in the trunk. Mr. Parks was one of the first to plant it in this state and thinks highly of it, but says it is a tardy bearer. It is productive and keeps well into the winter, but it is better as a fall apple. He has Tallman Sweet trees in good condition, nine inches through, that spread thirty feet. The Haas and Fameuse apples and Hyslop, Sweet Russet and Montreal Wax crabs are doing well. He prizes the Sweet Russet highly and this is the report from every one who has it. The trees of the Montreal Wax are large, leafy, sound and good. The fruit is pointed and about the size of the Hyslop. Mr. Parks exhibited 112 varieties of apples at the last county fair, among them many seedlings. In 1896 he sold 400 or 500 bushels, at 50c per bushel. He has one variety of wild plum that is extraordinarily infected with black knot, but it does not seem to spread to other sorts.

After taking supper here we went to Amboy on our wheels and spent the night there. In the morning we took the train to Garden City and had breakfast there before visiting the place of L. D. Mills.

Mr. Mill's farm is pleasantly located on the top of a bluff. The soil is retentive sandy loam. Here we found many large trees. Arbor vitae were thirty ft. high and twenty-six in. in circumference; European larch, set thirty years, forty-five ft. high and twenty-four in. in circumference; Norway pine set thirty years, forty ft. high and forty in. in circumference; and white pine set thirty years were forty-five ft. high and forty-five in. in circumference. Mr. Mills has several acres in small fruit. The fruit crop this year, including blackberries, raspberries and strawberries, was destroyed by frost. The raspberries, apple trees and shade trees were badly eaten by caterpillars. Apple trees are looking poor, probably on account of the depredations of insects. A peculiar stink bug infects the corn and berries.

We went from Mr. Mill's place to Lake Crystal on our wheels and there took the train to Mountain Lake.

Mountain Lake is a Mennonite town, having a population of about 1,000 and situated on a gently rolling prairie. It has every appearance of thrift and comfort. The grounds about the houses are well kept, neat and often ornamented with trees and shrubs. There are many small, well kept and thrifty young orchards in its vicinity. The farmers appear prosperous and have good houses and barns. The houses in general have shutters at the windows. Many of the people use brick ovens and burn manure to heat them, but some of the more progressive have given up this practice.

We visited Peter J. Dick and found him on a load of wheat, barefooted. He cannot talk English, so we talked through the boy as interpreter. Mr. Dick has a small good orchard one mile south of town. The older trees were planted twenty years ago. Three years ago he sold $160 worth of apples and last year $75. Most of his trees are Wealthy and Duchess, but he has Plumb Cider, Haas and a variety which we thought was Utter, the trees of which were large, sound and doing well. Trees of the Wealthy were measured twenty-eight in. in circumference and were heavily loaded with highly colored fruit. The Plumb Cider were twenty-five in. in circumference; trees perfect and large. The Duchess trees were large and bearing well.

Mr. Dick has a Russian mulberry hedge, about two feet high, trimmed square on the top, that is doing well. A hedge of Salix purpurea on his place, trimmed the same way, looks very ornamental.

After leaving Mr. Dick's place, we rode on our wheels to Peter Marten's, a distance of three miles. Mr. Marten has a good small orchard composed of Duchess, Wealthy, Minnesota, and large trees of what we thought were Utter and Plumb Cider. Trees of the Minnesota measured ten in. in diameter and were sound and thrifty. I should think the large trees in his orchard had been planted over twenty years. He has one thorn pear tree four in. in diameter.

From Mountain Lake we went to Windom by way of Bingham lake, a distance of about thirteen miles, on our wheels. We arrived at 8 P. M. and spent the night there.

On the morning of August 25th, we went on our bicycles to the home of Dewain Cook, a distance of thirteen miles. It is located on a rolling prairie, nicely protected by trees, and shows much care and good management on the part of the owner. The late spring frost about destroyed the apples, plums and grapes. The apple orchard is in nothing more than an average prairie location, and yet looks well. This year the blossoms were caught by frost, but last season he had a good crop. Among the varieties which we found doing well here are Yellow Transparent, Okabena, Tetofsky, Duchess, Early Strawberry, Minnesota, Grandmother, Crampton's No. 3, Sweet Russet, Antonovka, Pointed Pippin, Pride of Minneapolis, Hibernal, Patten's Greening and Rollin's Pippin. The most of these varieties were set in 1888, and have not been seriously troubled with blight or sunscald. The Success Juneberry is doing finely here and produced about seven bushels of fruit, but it is marketable only at a low price. Mr. Cook, however, believes it very desirable for the farmer's garden on account of its reliability and productiveness. We noted also a very handsome and unusually fruitful bush of black haw, a variety quite worthy of propagation for ornamental purposes. Strawberries and currants were a good crop this year. There is considerable alkali in the land in this section, and Mr. Cook has made some ridges, perhaps two rods wide, with a road machine, which he thinks gives the alkali a chance to wash out and improves the land for crops. This seemed to us a very interesting line of work. He finds that the Bederwood strawberry does better on alkali spots than either the Warfield or Haverland strawberries, and that currants do better than other kinds of fruit on such land.

Here we heard the Norway cottonwood, spoken of most highly. I am not yet able to make out what it is, but it resembles both our cottonwood and the Populus betulifolia of Europe.

On the way back to Windom we stopped at Jos. Wood's place. He has a nice young apple orchard of Hibernal and Duchess. The mulberry does well here and bears fruit larger than the blackberry. The Wood plum, a new seedling, is very early, good in quality, and very strong in the crotches. The Minnesota Early is also a good plum, and the Wyant does well. The Cheney fruits heavily but drops badly. He has a hybrid sand cherry of his own production, that is doing well, and several others, one from Williams, of Benson, Neb. We found here a thorn apple with large fruit and very peculiar and interesting foliage, and black walnut with oval fruit.

From Windom we took the train to Worthington, and had supper at the home of H. J. Ludlow. Mr. Ludlow's orchard is in town, near Okabena Lake, but on land about thirty feet higher than the lake. Here we saw the original Okabena apple tree, which now measures 35 in. in circumference. It spreads twenty-four feet and is reasonably sound for so old a tree, its only defect being a weakness in a share of the main branches on the south side, indicated by lighter and thinner foliage. It was bearing a good crop of fruit on the southwest side. The fruit of the Okabena keeps into autumn, about thirty days later than the Duchess. The Wealthy, on its own roots, measured 9 in. in diameter. Some of this variety, top-grafted on an

unknown stock, is bearing very heavily. It forms a remarkable union when worked on Briar Sweet and bears well. This seems to be a most desirable stock for Wealthy. It is a good, rapid grower in the nursery, and has a very strong crotch. The Briar Sweet which constitutes one-fifth of the orchard, is heavily loaded with fruit and never blights here. Mr. Wedge says that it does well everywhere. Mr. Ludlow has very many Duchess trees which are sound, good and heavily loaded with fruit. Tetofsky trees are planted six feet apart and doing well. The Whitney does not appear to be as long lived as others. The Milan crab is deep red, rather small and pretty. It would sell well on account of its fine color. The trees are very large, thrifty, regular and extremely good and heavy bearers. One tree measures 35 in. in circumference.

Grape vines did well while they were cultivated, but he has given up growing them because it does not pay. This place was formerly occupied by C. J. Hoffman, who planted many seedlings. The Queen gooseberry is doing well here. It has wonderfully healthy foliage. This variety was obtained from C. H. Hamilton, of Ripon, Wis.

The willows in a windbreak surrounding the orchard are dying at the top. We were told that they had never had the saw-fly but were dying from drouth. Black walnut trees near by measured thirty-nine inches in circumference. They were sound and good, and bearing well. Mr. Ludlow says that black walnut commences to bear in five years from the seed.

After going over Mr. Ludlow's place and taking supper there, we called on W. E. Stoutemeyer. He has a small, very nice old orchard of Wealthy, Duchess, Minnesota, Plumb Cider and one tree of Geniton. It is situated on flat land near town. The Duchess and Wealthy are very large, sound trees. He had a very fine crop of fruit last year but none this on account of frost.

On the 26th Mr. Ludlow's son, Milton, drove us to Chas. Saxon's and E. B. Paul's places and back to Worthington.

Mr. Saxon's place is about nine miles south of Worthington. He is a horticultural enthusiast and has a nice young orchard of Wealthy, Duchess, Whitney, etc. He has very pretty trees of the wild crab, which are fruiting very heavily. We found honey locust four inches in diameter, and Scotch pine growing here. Strawberries are doing well.

Mr. Paul's place is eight miles south of Worthington. Okabena, Wealthy, Duchess, Tetofsky and Soulard are doing well here. The Okabena and Tetofsky have been planted nine years, and Wealthy and Duchess twelve years. The Soulard, planted eleven years ago, is fine and spreads twelve feet. He has young trees of the much advertised Minnetonka apple, that make a poor showing.

After returning to Worthington from Mr. Paul's place, Milton Ludlow took us to the home of Frank Sundberg. This is eight miles north of Worthington. Anisim and Hibernal, planted seven years ago, were bearing heavily. The fruit of Anisim was large, red and well colored. Wealthy bears regularly and heavily. Trees of the Briar Sweet crab are large and doing very well. The Sandy

Glass (21 M) is an upright grower here and doing well. A tree of Karabovka, a small sweet apple of extra good quality, is promising.

Chas. Sundberg, living close by Frank Sundberg, has a good orchard of many well selected kinds, including Duchess, Wealthy and Briar Sweet. The Wealthy is doing particularly well. The trees measure 24 in. in circumference and Duchess about the same. The fruit of the Wealthy is very large and highly colored. He marketed 200 bushels of these two varieties this year. Duchess sold at one dollar per bushel this year and eighty cents in 1896. One Duchess tree bore ten bushels one year. The Briar Sweet is doing particularly well, trees 10 in. in diameter. Tetofsky bears well, and the trees are good. Whitney has not borne much. Okabena is doing well and bearing heavily. He has a young orchard of Hibernal and other Russians.

The Weaver plums are spotted and small while the Ocheeda is fair, bears heavily and sells well. It looks very nice this year. He also has many seedling plums. The Columbian raspberry is doing well, and the Loudon is doing remarkably well.

One year he used salt on his wheat, and it stood six inches higher and yielded nearly twice as much as that not salted.

From Worthington we took the train for Luverne. After supper we went to Blue Mounds, a distance of six miles, on our wheels and then called on Mr. C. E. Older.

Mr. Older lives in Luverne and has a nursery there. He is a pleasant, progressive man and carries a good stock of trees and shrubs, including Picea pungens, Pinus ponderosa and cut-leaved birch. He says there is no demand for the cottonwood, and that he has not sold any for several seasons. Near his nursery is a thick row of honey locust set about 1876. Some of the trees are five inches through, but most of them have killed out. A few are sprouting from the roots. Osage Orange planted about the same time grew six feet high and died. Mr. Older says there are many good timber claims in Pipestone county; that those of ash and elm have been successful but those of cottonwood have generally failed. West of the Sioux bottoms there is not a good timber claim of cottonwood, but there are many of ash and elm.

Mr. Older drove us to W. O. Preston's place, four miles north of Luverne. Mr. Preston has trees of Haas, Duchess and Malinda perfectly sound and healthy, and bearing well. Malinda trees were 30 in. in circumference. He is troubled with sunscald. It seems to be worse in this vicinity than around Worthington and Windom.

From Mr. Preston's place Mr. Older took us to the place of George Jacobs. Here we found a nice orchard, containing many of our best varieties. The Milton crab here seems to be the same as the Milan of Ludlow's. The trees are 6 in. in diameter, and planted 15 ft. apart each way. There is some blight on many kinds, but it is not serious. The Sweet Russet crab is a perfect tree in every respect. It does not blight, but is healthy and a good bearer. Trees about 21 in. in circumference. Mr. Older says it can not be recommended too highly for this section. Mr. Jacobs has no apple for which he

has such a demand as for Sweet Russet crab. The fruit ripens about September 1st, keeps from four to six weeks and is very large for a crab. Mr. Jacobs used the Whitney for top-working and as a windbreak. He says it is as hardy as an oak. The Northwestern Greening had borne well, but is now broken down and about dead. The fruit is very fine, but the tree seems to be very weak in the crotch. The trees of Plumb Cider are 26 in. in circumference, large and perfect. The trees of Wealthy are 21 inches in diameter. It bears heavily and is valuable. He marketed about 200 bushels of apples of various kinds last year. He has a nice windbreak of black walnut, four inches in diameter, which is doing well. His raspberries have been very productive, and *he does not cover them*, as they are protected by a grove.

After returning to Luverne, we took the Friday a. m. train to our homes.

GENERAL CONCLUSIONS.

Among the general impressions received from our visit were the following:

Large areas of southwest Minnesota are admirably adapted to growing apples and other fruits, as shown by the remarkable vigor of almost all varieties in this section. There would seem to be no reason why this section should set out crabs instead of large apples, as the latter are doing fully as well as crabs and are generally less disposed to blight. There seems to be less blight in this section than in eastern and central Minnesota. Many young orchards are being planted and generally look well. We did not see so many kinds of Russian apples as we expected. Yellow Transparent and Tetofsky were generally looking well, and Hibernal was vigorous wherever we found it. We think more Hibernal and Anisim should be planted. Plumb Cider is doing exceedingly well, and we found many large, thrifty trees of it, and Wealthy and Duchess are doing exceedingly well. Soulard crab has been widely planted and is also doing well. We were impressed with the great power of some varieties to withstand drouth when growing on good land. For instance, on Mr. Ludlow's place, at Worthington, the white willow has been seriously injured by drouth, while the apples on adjoining land were doing exceedingly well. There did not seem to be so close a connection between altitude and freedom from frost as we have noticed in some other sections.

Windbreaks are abundant and generally in good condition, but cottonwood is planted too often, and willow windbreaks are too often permitted to be ravaged by the larvæ of the saw fly. The green ash seems to be doing the best of any deciduous tree that is generally planted in this section. The Russian mulberry is evidently very popular among the Mennonites for its fruit as well as a windbreak. The honey locust has been thoroughly tried in this section, but has generally failed, and only scattering trees remain.

THE MOST PROFITABLE FIVE APPLES FOR MINNSEOTA.

D. F. AKIN, FARMINGTON.

Every paper must have a subject with one leading thought. The text assigned me for a five-minute dissertation is the following, viz: "The Most Profitable Five Apples for Minnesota." As there are no apples grown in the north half of the state, except two, and one of those a hybrid, the person who would attempt to name five of the most profitable apples for that part of the state might be considered a fit subject for the first inmate of the asylum to be located at Hastings, or Anoka perhaps. This is the thirty-first annual meeting of this state society, and at every previous meeting this subject has been discussed pro and con by the best learned and most experienced pomologists of this and adjoining states without coming to any positive conclusion as to the most profitable one variety—much more five varieties, and at this thirty-first meeting "poor me" must decide this very important matter to all persons who grow or intend to grow apples in this state. At one meeting several varieties would be mentioned for general cultivation, and during the following year nearly every variety has shown some serious defect, either in tree or fruit, so it has been necessary to change many of them and substitute others that have seemed to possess the requisite qualities. These changes have been necessary to get the very best varieties and show that the most profitable five varieties for the state have not yet been generally distributed.

One variety, the Duchess of Oldenberg, is accepted as a profitable one for the state, and as for the other four varieties a few more years of observation and experience must be passed before they can be successfully named. I believe the seedlings are now bearing which will prove to be the varieties to be in general cultivation in the state for profit; in fact, there are now several of Mr. Gideon's seedlings that are proving hardy and profitable. Some of these, with other seedlings that are now bearing, are, in my view, to be the profitable varieties for the state. I believe the persons who grow and test seedling apples are doing more for the successful and profitable production of apples in the state than all other means combined.

As it is left to me to name the most profitable five apples for the state, I will name the following: Duchess of Oldenberg, Borovinka, Wealthy, Malinda and Haas, as they have proved the best bearers and good market varieties.

In this connection it might be well to propose to this society, or suggest, a division of this state into three pomological districts, as follows: the first district to commence at the south line of the state and extend north eighty miles; the second district to commence at the north line of the first district and extend one hundred miles north; the third district to include all of the rest of the state north of the second district. This division of the state would seem to give the persons in the different districts a better show in selecting fruit hardy in their district; also in awarding premiums this division would give a fairer show.

The President: Has any one else a better list to suggest?

Mr. H. F. Busse: I take the Duchess, Peerless, Okabena, Wealthy and Longfield. I think the Haas is a good one too.

Mr. O. M. Lord: I take the Wealthy five times. (Laughter.)

Mr. J. S. Harris: Mr. President, I am not exactly agreed on the best five. I kind of agree with Mr. Lord: first, the Wealthy, second, the Duchess (that includes the Borovinka), third, the Longfield, fourth, Patten's Greening, and fifth, the Wealthy again. (Laughter.)

Prof. S. B. Green: I would put the Hibernal in somewhere.

Mr. Harris: I am willing to take the Hibernal, the Wealthy, Duchess, Longfield, Patten's Greening. The reason I put in the Patten's Greening is because I like it a little better than the Hibernal, but I am willing to take in both of them.

Mr. C. W. Sampson: I would say the Wealthy, Duchess, Hibernal, Patten's Greening and Longfield; I have not had much experience.

Mr. Elliot: Now, you must excuse me for speaking. I have not had much experience in growing apples for a good many years, and the experience I did have a good many years ago would hardly fit in at the present time, but my observation and from inquiries I have made in several trips I have made through the state would lead me to put the Wealthy first, the Duchess next, Longfield third, and I think Patten's Greening is so valuable that it can fairly take fourth place, and now as to the fifth I am undecided.

The President: Take the Wealthy again. (Laughter.)

Mr. Elliot: Of course I can adopt the plan of Mr. Lord and take the Wealthy five times, but I hardly think it would be fair. I think we have some seedlings that will occupy a prominent place in the apple list within the next few years. There is one apple I want to call your attention to, and that is the Peter. The Peter is a twin brother to the Wealthy, and it is a longer keeper, the same shape and color; in fact, it is very similiar to the Wealthy, and I think when our people come to know it they will like it. Of course, we have a good many new varieties, such as the Okabena and several other new varieties, and I think they will prove profitable.

Mr. Bush: I think the list suggested by Mr. Harris is a good one and will receive more support than any other, but I should like to emphasize the value of the Malinda.

Mr. Harris: That list just holds good for the present and

not for all time. I think there are some seedlings coming that will take the places of some of those mentioned, but for today, with the trial they have had, I think those designated are the best we have.

Prof. Green: What about the Malinda?

Mr. Harris: The Malinda is a great fruiter.

Mr. O. F. Brand: I would recommend the Peerless, the Duchess and the Wealthy; beyond that I could not go.

Mr. Dartt: I am rather gratified to be able to put in my list, because it gives me an opportunity of criticizing the whole crowd. (Laughter.) Now, many years ago, a good many years ago, before the hard winter of 1884-5, I had a great lot of Wealthy trees. I had great faith in that variety, and I put in about eight hundred trees, and some of them, the oldest, bore as much as a bushel of apples to the tree, but the hard winter of 1884-5 cleaned out every tree; there was not one left. I have not got a single tree now of the whole stock that is standing on the original stem. Of course, I grubbed out a great many of them, generally putting Duchess in their place, and on some of them I allowed the sprouts to grow, and they have come on and made trees, and they have grown quite a quantity of apples. If we could be sure of not having another hard winter that would clean them all out, I should not be so much opposed to recommending the Wealthy for general cultivation and sticking to it, but we have had a great many mild winters, and all of these varieties that have been so very promising have not had the test of a hard winter—some of them, at least—and they will be liable to go out when the test comes. I am at a loss to know what to put in there instead of the Wealthy. There are a great many seedlings that are very promising, and in my tests of over one hundred varieties it is a difficult matter for me to say which is best, so I think I will decline to answer the question.

The President: What in your opinion are the best five varieties of apples for Minnesota? Mr. Dartt is superintending a station down there where he is trying a great many varieties for Minnesota, and I am sure he is so close an observer that he has made up his mind which are the best five varieties.

Mr. Dartt: I have not made up my mind which are the best five varieties, but from my knowledge up to the present time my opinion would rather favor the Duchess first, and then I am inclined to think the Hibernal would come next; first the Duchess, then the Hibernal, then some of the Russians. The

Arabia and Patten's Greening are very promising, and the Okabena has grown well the past season.

The President: My experience with the Wealthy was similiar to that of Mr. Dartt, but it was not the fault of the Wealthy, it was my own. I put the Wealthy first in the list.

Mr. Lord: All my varieties went through the same process as mentioned by Mr. Dartt, but they have sprouted and grown bushels and bushels of apples since.

Mr. A. K. Bush: I would like to know if there is a man here who has half a dozen or a dozen of Wealthy trees that are sound clear to the top. If there is any one here who has one dozen sound Wealthy trees, sound from the trunk clear up to the top, from the first growth, that have been that way for the past twelve years, I would like to hear from him.

Mr. S. D. Richardson: As I understand it Mr. Bush wants to know if anyone has sound Wealthy trees over twelve years old. Mine are all young trees, and they would not come within that question, but if the gentleman will come to our neighborhood I can show him orchards of such trees that are bearing hundreds of bushels.

Mr. Bush: There are some men in the world who can do more in a year than some can do in a life time. I can compare the Wealthy in the same way. I know a little Wealthy orchard which pays the party who owns it interest on $3500, or about half what he would have to pay for a quarter section of land.

Mr. Robinson: I wish to say to the gentleman who asked if any one had a dozen or more trees more than twelve years old, perfectly sound from top to bottom, that I have such trees. I planted them myself and worked them, and I know today they are growing well and perfectly sound. There are some thirty of them, and they are thirteen years old.

Mr. Wedge: I think Mr. Bush made a good point in asking that question in regard to twelve Wealthy trees twelve years old. The Wealthy, since it comes into bearing very quickly, becomes diseased in some particular, frequently by blight. I know ten or twelve years ago you could not persuade friend Harris to recommend the Wealthy, because he thought it was a very poor tree for our section. My choice would be the Duchess, Wealthy, Hibernal, Patten's Greening and Longfield. I would not like to drop the Duchess and Hibernal, the only ones that stood the test of 1884-5.

Mr. Bush: I do not want this society to understand that I am against the Wealthy; it is the best apple I raise, but it de-

pends upon the location. I have seen more or less Wealthy killed on level land, but on high land, elevated ground, they do very well.

Mr. S. H. Kenney: I had fifty Wealthy trees in 1885 that yielded nearly a bushel apiece, and they were all killed but two. One of them has several times borne a sugar barrel full of apples, and the other has hardly yet recovered, but it bears about a bushel of apples a year. I have now about three hundred Wealthy that have just come into bearing. While I think the Patten's Greening is the best apple so far as quality is concerned, I still think a good deal of the Wealthy, and shall retain what I have. I mulch them heavily, and I think the plan of Mr. Somerville is very valuable if one is in a position to carry it out.

The President: Give us your best five varieties, Mr. Kenney.

Mr. Kenney: The Hibernal, Patten's Greening, Duchess, Longfield and Wealthy.

Mr. J. P. Andrews: The list that Mr. Harris gave would suit me about as well as any.

Mr. Cummins: I would like to see the Lou put in that list. It is one of the best early apples. I would put the Wealthy first, the Lou, —the Duchess does no good in our neighborhood,—the Utter has done well with us, and probably the Patten's Greening.

How I Raise Tomato Plants.—As early in the spring as I can get around to it, usually by the middle or last of March, I plant tomato seed in small wooden boxes that will fit upon the shelf above the cook stove. I make the earth fine and soft, sprinkle well after planting the seed, and cover with a thick paper or pane of glass—anything to keep the earth moist and warm. I do not let the earth get dry. In four days, often, the seed is well up, and the boxes must soon be removed to a sunny window. Care is taken not to let the young plants get chilled at night. As soon as the plants show three or four leaves beside the seed leaves, I transplant into other boxes, pots, tin cans or anything that comes handy. I find that plants set in baking powder boxes (pound size) grow much faster and are far and away beyond all the others in size and general appearance. I have not noticed that any special brand of baking powder has advantage over another, but plants in such cans do rise wonderfully. Before filling with earth, I make with a hammer and sharp nail, a few holes in the bottom of each can. In June I have fine plants to set in the garden and usually can sell enough to well pay me for the little trouble I have had in raising them.

Obituaries.

JOHN A. SAMPSON.

LATE OF EXCELSIOR, MINN.

John A. Sampson was born in Maine on June 17, 1846, and died at Excelsior, Minn., January 28, 1898. He came to Minnesota with his parents when four years of age, traveling by boat via the Ohio and Mississippi rivers. Cholera broke out on the boat en route, and the family, with the dead body of the mother, were put off at Red Wing, then a part of the country inhabited mostly by Indians. She was buried on the banks of the river in a rudely constructed pine coffin, and the rest of the family was then broken up. The subject of this sketch was taken into the family of a friendly Sioux Indian woman, with whom he lived for some time, and when seven years of age he was bound out to a man who proved himself a very hard taskmaster, and in whose service he remained only one year. Thus from the time he was seven years old he buffetted his own way through the world, and his whole life proved a continuous although a brave struggle with adversity. At the age of eighteen he enlisted under the last call for troops made by President Lincoln, but peace being soon after declared he never saw actual field service.

Mr. Sampson was married three times, two children by his first and one by his second wife, and his third wife with four children, surviving him. For the past twenty-one years he has lived at Excelsior, where he was engaged in market gardening and fruit growing. Eighteen years ago he made a start with fifty Wilson strawberry plants and a handful of Turner raspberry plants, and at the time of his death he was one of the largest fruit growers at Lake Minnetonka.

In 1892 he was a candidate for legislative honors on the prohibition ticket, and, although defeated, he received liberal support from all parties. He united with the Methodist Episcopal church in 1886, of which he was a member at the time of his death. He was an active member of the State Horticultural Society for the last nine years of his life, and the various papers written by him and the discussions in which he took part, which appear in former reports of the society, attest to his deep interest in and practical knowledge of horticulture.

Mr. Sampson was a man of genial nature, of the highest honesty and integrity in all his business affairs; of indomitable pluck, with "a heart for any fate," having had a life's experience in the school of adversity, and even when the fatal disease to which he finally succumbed attacked him more than three years ago and it seemed to

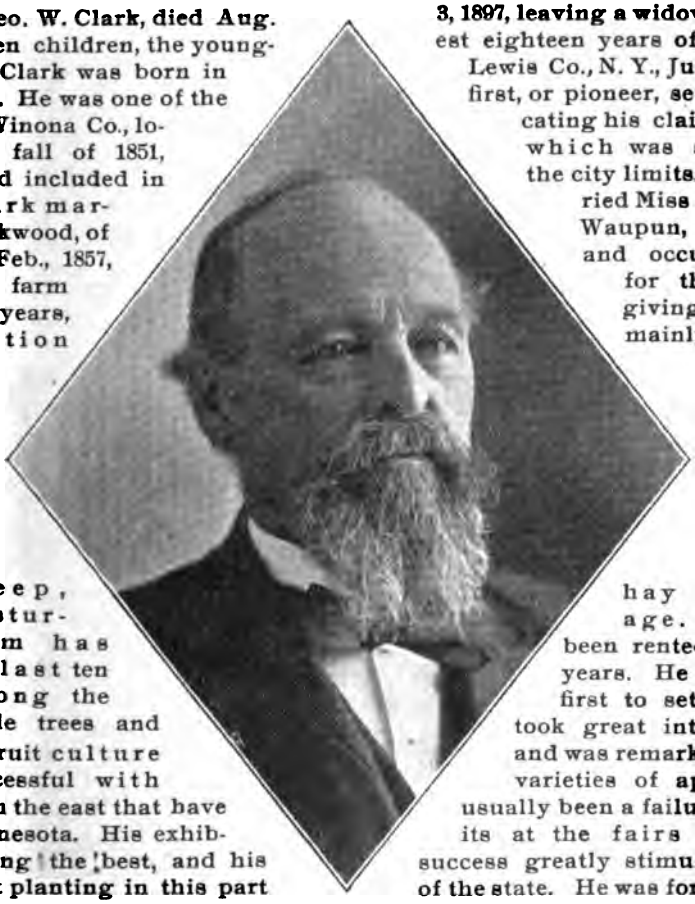
be a question of only a few days when the end would come, he still held on to life with that grim determination and purpose to succeed which were characteristic of him. Although his life was a ceaseless struggle with adverse fate and discouragement, yet he did not live in vain; he fulfilled a mission in life, and he could say with Shakespeare:

"Sweet are the uses of adversity;
Which, like the toad, ugly and venomous,
Wears yet a precious jewel in her head;
And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything."

Excelsior, Minn., Feb. 15, 1898. —A. G. LONG.

GEO. W. CLARK,

LATE OF WINONA, MINN.



Geo. W. Clark, died Aug. 3, 1897, leaving a widow and seven children, the youngest eighteen years of age. Mr. Clark was born in Lewis Co., N. Y., June 10, 1827. He was one of the first, or pioneer, settlers of Winona Co., locating his claim in the fall of 1851, which was afterward included in the city limits. Mr. Clark married Miss Jane Lockwood, of Waupun, Wis., in Feb., 1857, and occupied his farm for thirty-five years, giving attention mainly to sheep, pasturage. His farm has been rented for the last ten years. He was among the first to set out apple trees and took great interest in fruit culture and was remarkably successful with varieties of apples from the east that have usually been a failure in Minnesota. His exhibits at the fairs were among the best, and his success greatly stimulated fruit planting in this part of the state. He was for several years an active member of the State Horticultural Society. To his family he was known as a kind and affectionate husband and father, and to his neighbors, as an intelligent, candid and honest man, in all the relations of life.

O. M. LORD.

OBITUARIES FOR 1897.

(REPORT OF THE COMMITTEE ON OBITUARIES, J. S. HARRIS, Ch'n.)

In the year that has passed since the last annual meeting, our society has sustained greater losses, in the death of our associates and prominent members, than in any former like period since its organization. Among those we are called upon to chronicle at this time are, Martin W. Cook and M. J. Hoag, of Rochester, George W. Clark, of Winona, Wm. E. Brimhall, of California, (formerly of St. Paul, Minn.), Wm. Urie, of Minneapolis, Warren W. Pendergast, of Hutchinson, E. J. Cutts, of Howard Lake, M. Pearce, of Chowan, and Wm. Danforth, of Red Wing. These worthy friends, like many others who have devoted time, talent and labor, and many of them the best years of their lives, in aiding in the building up of this society, until it has become one of the strongest and most influential and useful institutions of the state, who have so ably aided in the development of the fruit interests of the northwest and transforming a wilderness into gardens of fruits and flowers, have finished their labors and gone to receive their reward. Thus one after another of the old veterans who have stood with us bravely battling against discouragements and disasters, often defeated but never conquered, are passing away, and ere long all of the founders and early supporters of the Minnesota State Horticultural Society will have finished their work and joined the countless millions of the departed. While we mourn their loss, and sorrow that we can no more look into their faces or feel the joyful thrill of the cordial handshake, and we miss them in our councils, we trust they are partaking of the fruits from the tree of life that perish not with use. We point with pride to the noble works of these brave, self-denying men, who have labored so faithfully to make the world better, and the farm and village homes beautiful with horticultural adornments and happy in the enjoyment of an abundance of the best fruits of the earth. They have laid the foundations broad and deep upon which a structure is being built that shall endure through all time. In the midst of our sorrow we rejoice in their works that do live after them.

Martin W. Cook became a member of the society about 1877, and died at his home in Rochester, March 6th, 1897, aged 70 years. (See Report of 1897, page 133, for biography and obituary notice).

Geo. W. Clark became a member in 1875, and died at Cleveland, Ohio, where he was receiving medical treatment, August 3rd, 1897, aged about 71 years. Geo. W. Clark was one of the pioneer settlers of Winona county, and opened the first farm in the town of Winona, in the spring of 1852, and planted one of the first apple orchards in the state, and was for a number of years a prominent exhibitor of fruit at our state fairs. His residence during the later years of his life was in the city of Winona.

Wm. E. Brimhall became a member of the society in 1868, and died in California in July, 1897, aged 72 years. (For biography, see report of 1897, pages 253 and 338.)

M. J. Hoag became a member in 1876, and died at his home on

College Hill, Rochester. Mr. Hoag was a careful and skillful cultivator and a successful grower of small fruits.

Wm. Urie became a member in 1888, and continued to sustain this relation steadily till the time of his death in April, 1897. He was especially interested in bee culture and a prominent member of that kindred organization.

E. J. Cutts became a member in 1891, and died suddenly at his home in Howard Lake, September 22d, 1897, aged 53 years. (For biography see page 412, report 1897.)

Warren W. Pendergast became a member in 1896, and died at the home of his parents in Hutchinson, August 26th, 1897, aged 22 years (See page 373, report for 1897.)

M. Pearce became a member in 1876, and died at his home in Chowan, October 6, 1897. (See page 453, report for 1897.)

Wm. Danforth became a member in 1886, and died in 1897. (For obituary, see index, report of 1898.)

A WONDERFUL PROVISION OF NATURE.

H. SWEET.

If we examine the fruit trees as they start in spring, we will notice two classes of buds; one large and round, which will come out blossoms, and the other sharp-pointed and producing only leaves. The fruit buds are always on the older branches of the trees, while leaf buds appear on all parts and exclusively so on the new shoots. These buds are wrapped up in cerements alike impervious to wind and weather, and the infant leaf and flowers are safely shielded through all inclemencies of winter for the genial influence of spring to warm into life and beauty.

BUD AND STEM

This preservation is very wonderful, for both leaf and flower are delicate and the least exposure to frost means instant death. But enveloped in these thin folds of nature's providing, the tender germ lies snug and safe, capable of enduring all the rigors of the severest winter. These invulnerable bud shields are quite thick and are glued together by a gummy substance that effectually shuts out all the rains and cold until the sunshine is ready for the little nursling within, and then they open gently to let it grow and expand. In the bud of the horse chestnut this arrangement is beautifully seen. As the only object of this casing is to protect the dormant bud during the winter, it is cast off as soon as the leaf begins its expansion in the spring and will be seen scattered profusely beneath the tree.

A close examination of one of these cast-off scales will show that the outside is a flinty shell, but within is a lining of the softest velvet, the dainty and downy swaddling clothes of the coming generation of leaves and flowers. We wonder at these special adaptations of God's handiwork—a feeling which is increased when we learn that buds in warm climates do not have this winter protection.—*O. J. Farmer.*

their assistance was highly appreciated. A report of this meeting by Mr. Wedge, our society's delegate, appears in this issue. Prof. L. H. Bailey, of Cornell University, spent a day with them and swapped experiences with the veterans of Wisconsin horticulture.

THE "WISCONSIN HORTICULTURIST" IN 1898.—This organ of the Wisconsin Society is to be continued the current year, under the management of Mrs. Franklin Johnson, Baraboo, Wis. Subscription, 50c. per year. It is an interesting journal, and contains much that would be found valuable to Minnesota planters.

SEC'Y PHILIPS, OF WISCONSIN.—We are glad to hear of his re-election to the office of secretary in the Wisconsin Horticultural Society. His intelligent oversight of the important experimental work that society is carrying on would be greatly missed if he were to retire, and we hope to see him in the harness for many years yet. Mr. Philips' sons, we understand, are to succeed him as the active managers of the hill farm and orchard and leave him more at liberty to pursue his inclinations in this interesting work. The Wisconsin society is fortunate in having so practical an officer.

DO YOU WANT THE GROUP PHOTOGRAPH?—Many inquiries have come in as to this photograph, the one appearing in a reduced form as frontispiece in the January, 1898, number. It can be had of W. R. Miller, photographer, No. 427, Nicollet avenue, Minneapolis, mounted ready for framing, and delivered at the express office, for $1.25. Send directly to him. The size of the picture is 18 x 22 inches.

DEATH OF DR. R. C. RICE, IA.—The sudden death of this gentleman, the president of the N. W. Iowa Horticultural Society, is announced in the opening issue of "The Fruitman," referred to elsewhere in this issue. He is spoken of in that journal as an ardent devotee of our art, and one whose "discreet counsel will be sorely missed."

A NEW IOWA FRUIT PAPER.—Northwestern Iowa has just brought orth a new journal of the horticultural variety, under the title of "The Fruitman," edited and published by M. E. Hinkley, of Marcus, Ia. Mr. Hinckley is a nurseryman, evidently with a literary ambition, which this bi-monthly is intended to satify. Price 25 cents per annum. At present he is vice-president of the N. W. Iowa Horticultural Society. The sheet contains much matter of local interest, and we hope may develop, as it has a right to, being, as we understand, the only strictly horticultural periodical in that state.

ALMOST AN OBITUARY NUMBER.—The unusual number of deaths that have lately taken place in the ranks of our society casts a shadow across our pathway, and reminds us that the point is rapidly approaching at which the work of each one of our number must be laid aside, and of our career here it will be said, "it is finished." In the light of this solemn and certain fact, how petty and trifling seem the efforts of any to advance a selfish interest to the detriment of the very important public charge committed to our keeping. Let each of us examine candidly his own heart and life and see if his purposes are pure, and looking to the good of others than himself. To have it honestly said over our last resting place, "well done," is an ambition we may most worthly strive for.

SOME OF THE FRUIT SHOWN AT THE LAST MINNESOTA STATE FAIR.

THE MINNESOTA HORTICULTURIST.

VOL. 26. APRIL, 1898. No. 4.

PLUMS.

(AN ADDRESS)

PROF. E. S. GOFF, MADISON, WIS.

Mr. President, Ladies and Gentlemen: It gives me much pleasure to meet with you at this time. I have long had a desire to attend your winter meeting, but it happens that our Short Course in Agriculture is in session at this time, and we have felt that we must attend to our home duties first, so it is not often that I get away in the winter. My friends seemed anxious that I should come this time, so they sent me in spite of my work, for which I am very glad.

I do not feel competent to sum up the plum question. It is true, I am giving considerable attention to the plum at this time, but my experience has not extended over a long period.

First, in regard to chickens in the plum yard as a remedy for curculio. I do not know whether Mr. Gibbs visited the New York Experiment Station at the time I was there or not. I was at the New York Station seven years, and during the first six of these years we kept chickens in and the seventh year we took them out of the plum yard. Those six years we had a good crop of plums. The year we took them out we did not have any. Whether or not the chickens ate the curculio, I do not know. The plums that were not protected in that orchard were a total failure. We grew only the European plum, and that plum is almost certain to be a total failure in New York unless the curculio is conquered. Our theory was that the chickens ate the curculios as they came out of the ground in the spring. I will confess I never caught a chicken eating them, but I do know we had plums. Possibly, they ate the larvae as they escaped from the fruit.

I am something of a young convert in regard to the native plums. I came west with the idea, which I think a great many eastern people have, that the native plums are not worth growing where we can grow anything else, and I planted our first Americana plums with that idea. We also planted a few trees of the Green Gage, the Orleans, Lombard and some other standard varieties of the east, and some Russian plums. The plums bore some fruit three years after planting. Last year we had a very fine crop of both Americana and European plums. The European plums were very fine, and I began to think that after all we might be able to grow the European plum

in the west. But I found on examining the plum buds last spring that almost without exception the European plum buds were destroyed; they were all black at the center after the cold snap we had, during which the thermometer went down to 23° below zero. I examined our Americana varieties and found that every plum bud was bright. I examined our Japanese varieties, and I found that a portion of them was totally destroyed and a portion of them were alive. The only European varieties that opened any flowers last spring were a few of the Russian sorts. So I discovered, at least, the fact that the Americana plums are much hardier than the European. It is a fact I have seen stated frequently, but never had it so forcibly brought to mind before. I began to look up the published reports on the subject, and found in Manitoba the native plums had borne good crops when the mercury during the winter had descended to forty degrees below zero.

During the summer I asked a variety of questions of a good many people in regard to plums. One question I asked was about the market price of plums. I learned of a plum grower in Manitoba, by the name of Frankland, from whom I received a letter, of which I will read a brief extract. Among other things he says, "This year I had forty bushels of plums, twenty-five of which I sold to Messrs. Robinson & Co., of Winnipeg. I sold some out for preserving, and they were sold at the same price as the Oregon and British Columbia fruit. They conclude a letter by asking advices in regard to next season's crop." When I read this letter I thought of it seriously. Here is a fruit grower living several miles north of Winnipeg, a country that I had supposed not suitable to the culture of any tree fruit, and we find him selling Americana plums, and selling them on the market at the same prices as the Oregon and California plums. It came across my mind very forcibly that the native plum is the fruit that we in the northwest will do well to tie to. It is a fruit that we can grow and grow successfully, furthermore, and a fruit that we can sell successfully.

A few years ago, while Prof. Smith was director of your experiment station, he remarked to me one day, "We cannot grow the apple in Minnesota; we may be able to grow it in the southern part of the state, but in the central and northern portion I have no hopes whatever that we shall ever be able to grow the apple." I don't know whether he was prejudiced or not. We can grow the Americana plum in northern Minnesota and northern Wisconsin and throughout all the northwest, I believe.

I have also taken the trouble to learn how the fruit sells in the eastern part of the country, and will read part of a letter from Mr. Kerr, of Maryland, whom some of you know as a plum grower. He writes, "The facts in the premises are about in this way: from about two hundred native trees I have not gathered fruit sufficient to make a test of value between the native and European varieties. But the European varieties were a drug in the market at from 20 cts. to 30 cts. per peck, while the natives sold here readily at from 40 cts. to 60 cts. per peck." I also have a note from Dr. Dennis, of Iowa. He says, "The prices here ranged from one dollar to two dollars per bushel

for natives. I could not get any more for the Japanese. Last year I saw bushels of very fine Damsons, for which there was absolutely no sale, thrown into the Cedar river, while the natives have always sold readily at a fair price. There seems to be a great demand by our people for the natives, for the reason, perhaps, that they used to be the only kind of plums to be had."

In regard to the quality of the natives: I came here with the idea that it was much inferior to the European; on closer acquaintance with them, their quality pleases me very much. I am sure those of us who have eaten the Surprise plum know that no European plum surpasses it, and I think if we do away with the skin of our best Americana plums, the flesh is actually far superior to that of the European plum. We have some Americana plums, the Aitkin for example, the skin of which is not thick enough to be objectionable. The skin of some of the natives peels off very readily. So I am sure that the finer varieties of the Americana plums are not inferior to the average European in quality, and perhaps not inferior to the best. I speak of the Americana plums merely. There are, of course, several other native species that are cultivated to some extent in Wisconsin and Minnesota, but we shall have to fall back on the Americana species. I also think, as far as my experience goes, that the finest quality we have comes from this species.

The Aitkin plum belongs to the so-called Nigra group, which has been described as a distinct species. This group is found further north than any other of our native plums; so we have every reason to expect that the Aitkin will be entirely hardy.

I find that, as a rule, the plum growers of the northwest do not seem to think it necessary to fight the curculio. I may be mistaken but from my observations I conclude that the damage caused by the curculio is on the increase, and I think it will not do much longer to neglect this insect. In the east it is found that plum growing is impossible unless the curculio is vigorously fought.

I wish to object to the recommendations, that have been so often published, to plant the native plums closely together. I do not think this is good horticulture. We know that nature plants her trees closely together. It will not always do to imitate nature in horticulture. It is certainly not good sense to plant our trees so close together that we cannot get between them to spray. I saw the Rollingstone plum on Mr. Lord's place where the top of the tree was twenty-five feet in diameter; and where the top of a tree grows twenty-five feet in diameter I do not think it is good sense to recommend to plant the trees twelve feet apart. Those trees that grow so large ought to be given room enough. I would not advise planting the larger growing varieties less than twenty feet apart nor the rows less than twenty-five feet apart. I believe the insects will take care of the pollenization. I believe in planting them far enough apart so we can get between them.

In our own case we shall have to do a good deal of fruit thinning if we are to succeed in growing good crops continuously. There are several varieties that will overbear to an extent that will destroy the trees in a few years unless the fruit is well thinned. It has been

my experience in thinning that I am afraid to take off enough. This past summer I made the experiment of thinning the plums to about two inches apart, and it seemed to me I was taking off four-fifths of the crop, but at maturity the fruit was still too much crowded and the plums were undersized. The trees had overborne in previous years.

I find that one difficulty in marketing the native plums is the way in which the wild plums are brought to market. They are brought in bushel baskets, washtubs and in every other slovenly manner. What we should do is to put up our plums in such a nice way that they will not be compared with the wild plums, as they are usually sold, and so that they will sell on their merits.

It seems to me the fruit growers of the Northwest will do well to propagate the best native plums for market as a market fruit. True, some of us are doing it already, and I think, perhaps, the average farmer who has a taste for fruit growing will be able to make more money from the best native plums than he can from apples or other tree fruits. I think the climate is not against us in growing the native plums. If this is true, we need not bewail the fact that the northwest is not good for fruit. If there are some fruits we cannot grow we can afford to let them pass by and not whine and complain that the climate is such an enemy to us. I would not advise any one to go into plum culture extensively as yet. The large markets are not yet fully acquainted with the merits of the native plums. We will have to educate the people in our large cities to the merits of our native plums. Some of my correspondents have written that they find their best markets in the small towns and villages, where the people have been accustomed to wild plums and know their qualities.

I will add, in conclusion, that I am now preparing a bulletin on this subject of native plums which I shall be happy to send to you all, when it is issued.

AN EFFECTIVE REMEDY FOR CUTWORMS, especially on onions, is a mixture of one pound paris green with thirty pounds of dry bran and middlings in equal parts. This mixture can be distributed by means of an onion seed drill, and thus deposited evenly and continuously about the margins of the fields before the advancing destroyers. It forms a line of defense across which the worms will seldom pass without feasting to their death. If the worms become scattered over the fields, the dry bait can be applied quickly and uniformly alongside the rows by use of the drill. This treatment, says Bulletin 120, N. Y. Station, is fully as efficient as hand picking, is less expensive, and for onions, at least, is a very satisfactory defense against the cutworms. It can also be used successfully and with ease to protect cabbages, tomatoes, egg plants, sweet potatoes, strawberries and similar garden plants, by surrounding each, at time of transplanting, with a little of the poisoned mixture.

THE MOST PROFITABLE FIVE CRABS AND HYBRIDS FOR MINNESOTA.

J. R. CUMMINS, WASHBURN.

To be profitable the hybrid or apple must be of good quality, must have productiveness, hardiness and be generally free from blight.

Of the crabs and hybrids recommended by the horticultural society for general cultivation in Minnesota, I have the Martha, Briar Sweet, Early Strawberry and Whitney in bearing, but of these four not one can be called perfect. In quality the Martha is the best. The tree seems to be perfectly hardy and free from blight, but its one fault or failure is that it is a poor bearer. The blossom does not seem to have the power to stand frost or unfavorable weather, as the Florence or Wealthy. While the Martha bloomed well this year and last, 1896 and 1897, there was but little fruit. The Florence and Wealthy near by fruited heavily both years.

The Briar Sweet is a heavy and regular bearer, seems to stand the climate well, and if salable would be the most profitable of the four to grow.

The Whitney is a good bearer; the Early Strawberry is more productive, but neither, probably, perfectly hardy nor as salable as other hybrids. The Florence, though rather small, is one of the most productive of the crabs or hybrids, one of the varieties that never fails. The tree is very hardy, free from blight, and the quality of the fruit is good for table use.

While the Transcendent cannot be recommended for general cultivation because of its blighting so badly, yet, in some few locations or under certain conditions, it can be grown profitably. As to location: six miles southwest of Minneapolis on land of Mr. J. T. Grimes, there is a fine orchard of Transcendents. The trees are large and handsome, almost entirely free from blight and about twenty-five or thirty years old. The Transcendent grown in sod or not cultivated is almost free from blight, while near by where cultivated and manured it blights worse than any other hybrid or apple.

The Orange is one of the profitable hybrids; it may not stand all of the winters, but the tree is a regular bearer, and the fruit one of the best for cooking. The Hyslop sold in Minneapolis at $1.50 to $2.00 a bushel in the fall. With the Virginia I have had no experience, but from the recommendations of others it is one of the best varieties.

Of the new seedlings, Mr. J. S. Harris says (fol. 26, 1896, page 341): "Lyman's Prolific is worthy of looking after on account of hardiness, size and productiveness." This tree originated some thirty years ago, about two miles south of Excelsior, and has never been injured in the least by any winter since then; is almost entirely free from blight; a heavy, annual bearer; fruit, good quality; season, October.

Of the many new seedlings, grown in this state, we have good reason to expect there will be some which will excel in hardiness and quality the old varieties of hybrids. At this time I would

recommend as the best five crabs or hybrids: Virginia, Lyman's Prolific, Florence, Martha and Orange.

Mr. Bursap (Iowa): I want to give a note of warning in regard to the Virginia; it has been especially recommended for stocks. There is but one Virginia that is all right. When young it seems to do well. I have Virginia twenty-five years of age, but they commence to body blight. I can heartily commend it; it is all that is claimed for it when young, but when it gets to a certain age its body blights, and if that is the case we want to use it carefully.

The President: Does the true Virginia blight? I have never been able to definitely trace the true origin of it. It has been grown around St. Paul and this particular section of country for a great many years. I think Mr. Brimhall was the first man who ever called my attention to it. Prof. Green, do you know the true origin of the Virginia? Has it ever been found?

Prof. S. B. Green: Prof. Budd says it is a wild crab of Siberia, but the Virginia is an upright growing tree. There is one here called the Virginia which is just the reverse, it makes a large, spreading tree.

Mr. G. H. Van Houten (Iowa): I have looked up both of them very closely. The apple I recommend under the name of Virginia—and I only recommend it as a stock, and it has proven a good stock—was discovered as a stray in the nursery of Sewall Foster, and he has scattered it all over Illinois through our horticultural stations.

The President: Mr. Dartt, will you give us your list?

Mr. Dartt: Martha, Virginia—and Tonka; I should put that in as the fifth.

Prof. Green: Martha, Virginia, Sweet Russet, Strawberry and Gideon's No. 6.

Mr. Dartt: I do not think much of the No. 6, and the Strawberry is not worth shucks. (Laughter.)

Mr. Wedge: Prof. Green named my list. I want to make one remark in regard to the Martha. Mr. Cummins says the blossoms blighted. That is simply the habit of the variety, of the young tree.

Mr. Cummins: My trees are twenty-five years old.

Mr. Wedge: Wherever I saw it, it occurred in young trees.

Mr. F. W. Kimball: I have no list of five varieties. I would like to see the Minnesota crab there. I think a great deal of it. I think it is one of the most valuable varieties. I think the name is a misnomer; I think it should be cut off from the

crab list. The name "crab" is a misnomer. The people do not regard it as a crab, and they reject it. If it was not named as a crab, they would pay more attention to it. It is more than an ordinarily good apple. It is very free from blight. It is a large apple; it would not compare with Patten's Greening, but it is a large apple. It is larger than the Anisim and larger than the Longfield and a dozen different varieties I could name. It is very thrifty and free from blight. I have no list of crabs that I could mention.

Mr. Harris: The five varieties I would name from my experience and observation are the Golden Beauty, Virginia, Tonka, Sweet Russet and Pride of Minneapolis.

VARIETIES OF PLUMS FOR HOME USE AND FOR MARKET.

O. M. LORD, MINNESOTA CITY.

For home use, *quality* is the first consideration, next early and annual habits of bearing, hardiness, thrifty growth and exemption from fungous and other diseases. The best varieties are such as have a firm, meaty pulp and a skin that is not tough and leathery when cooked, that do not retain bitter, nor acrid properties about the seed, and that retain the fruity and delicious flavor of the native plum without the intense sourness peculiar to many kinds. There are several varieties not having all these qualities that can be made very palatable if properly handled, and though the pulp may be soft and the skin thick they may be nicely adapted to jellies, jams, etc. It is a mistake to use soda for any kind of sauce from the native plum. It neutralizes the acid, of course, but the sauce is insipid and entirely changed in flavor. A better way for most varieties is to steam the fruit until the skin cracks; then place in the preserving kettle with sugar or hot syrup, and cook slowly until thick enough to keep well. By this process it will be found that even quite inferior kinds have parted with their acrid taste, and in some kinds the skin will entirely disappear. This process is equally adapted to the very best varieties for cooking. All kinds, for all uses, should be thoroughly ripe but not over ripe.

For home use it is also desirable to prolong the season. A very good succession is the Cheney, Rollingstone, Desota, Ocheeda, Weaver and Miner. These will usually cover a period of two months in ripening.

If varieties are desired for peeling to can, the Wyant, Surprise, Comfort, New Ulm and Stoddard are of large size and excellent quality, and are among the best for that purpose.

For market, those with a soft pulp are entirely unfit; and I am sorry to say that for market quality does not count so much as appearance. Plums of large size, of bright color and firm texture, in the general market will sell better than those of small size, of

dull color, though the peculiar qualities for cooking or eating may be better in smaller ones. For market purposes, several varieties are also very desirable, as on account of the habits of the variety or the peculiarities of the season, one may not bear, while another will produce abundantly. The Desota, which is usually one of the most reliable, did not bear on my grounds this year, nor the Weaver, Wolf, Rockford, Speer and many others, while the Rollingstone, Wyant, Cheney and others overbore. On my grounds, for distant market, owing to their keeping and carrying qualities, and for eating out of hand, I have found no variety to excel the Rollingstone. For near market, the Wyant, Gaylord, Desota, Hawkeye and New Ulm are very attractive and readily sell at good prices. These observations are recorded from my own personal experience, extending over several years.

There are other varieties lately brought to notice, embodying all the good qualities above mentioned. They have not yet been introduced in the general market. Of these the Aitkin is said to be the largest and the earliest to ripen. Among the later varieties, Penning's Surprise will occupy a prominent place, for its many desirable qualities.

Mr. Wragg (Iowa): Mr. Lord, which would you consider the best three native plums?

Mr. Lord: In my paper I have tried to confine myself to those grown in the nursery. I should have to give the answer to that question from my own standpoint or from my own list. I would place the Rollingstone first as to fruit and for market, perhaps the Surprise next, and I cannot go back on the Desota, so far as I know anything about it.

Mr. M. Penning: I have a little different opinion than some of the gentlemen. I would suggest the Stoddard, the Wyant and the Surprise as the best three.

Mr. A. K. Bush: I would feel very much like naming the Desota three times. (Laughter).

Mr. F. W. Kimball: I would name the Gaylord for one, the Cheney and the Desota. Those are the best I have.

Mr. Penning: I want to say a few words more. I went up to Redwood Falls this fall with some plums which I took to the fair. I had the Wolf, Wyant, Stoddard, Surprise and Weaver. They did not have a plum list, and they did not know what to do with those plums. They had a committee appointed on premiums, and they awarded first and second premium on plums, the first on the Surprise and the second on the Stoddard. That was all they said about them.

Mr. Wedge: Speaking for myself, I can certainly give the first place to the Desota, and then as an early plum I think

very favorably of the Aitkin, and I guess the Wyant would be the third.

Mrs A. A. Kennedy: Have you grown the Aitkin so you know it is reliable?

Mr. Wedge: Oh, no, but I know of its extreme earliness in ripening, long before the Desota is ripe. We have no use for the Forest Garden.

Mr. D. Cook: The best plums for market, to my mind, are the Desota first, and as an early plum I know of nothing better than the Wood. I would put the Desota and Wyant in first and second place and the Wood third.

Mr. Kimball: I would like to inquire of those growing the Stoddard whether it is perfectly hardy?

Mr. Wedge: I have had the Stoddard for a number of seasons, and it does not appear to pass through our winters in a perfectly satisfactory manner. It does not appear to endure our climate first-rate; it has a weak and poor appearance in the nursery and kills back more than any other plum we have. I was very much in favor of the Stoddard on account of its behavior, but for the last two years I do not think it has a good constitution.

Mr. S. D. Richardson: I have had no plums killed back the last five or eight years.

Mr. Wedge: Mine killed back a little every year where they made a strong growth.

Mr. Penning: How old are your plum trees?

Mr. Wedge: About five or six years old.

Mr. Wragg (Iowa): Where did you get your Stoddard plums?

Mr Wedge: That is a point of some interest. I got them from Mr. Patten, and I got them for the Rockford. I sent the pit to you at some time, and you recognized the pit as the Stoddard. I think I have the Stoddard. It was shown at the fair, and it was claimed there that it was the Stoddard.

Mr. Wragg (Iowa): I had the honor of introducing that variety, and I sent it away up to Manitoba, and I have had good reports from Madison, S. D., to Bismarck. Eight years ago in some places it was worked and sent out as Americana. That is the reason I asked Mr. Wedge where he got it. I first put it on the market and first brought the fruit before the public, and it was the largest and best American plum.

Mr. O. M. Lord: Mr. Wragg sent me several Stoddard trees

a few seasons ago, and they are thrifty, they have never winter killed, have borne every year. The plum is very large, it is a handsome plum and of superior quality; it is a very valuable market plum.

Mr. D. T. Wheaton: I have the Desota, Weaver, Cheney, Wolf and Forest Garden, and all have done well with me. The Desota is the best. The best three are the Desota, Wolf and Weaver.

Mrs. Stager: The Weaver is not doing anything in our part of the country. The fruit, after it gets to the size of a pea, blights and rots and dries up. It may be the difference in the climate up there.

Mrs. Kennedy: Is the Wolf a free bearer early? I have some that bore very late. Is that a general characteristic?

Mr. Wheaton: The trees that I have came into bearing very early, while small.

Mr. Doughty: I have had a few plums on the trees of the Wolf in the nursery row.

OUR REPORTS FOR PUBLIC SCHOOL LIBRARIES.

(A DISCUSSION.)

Mr. A. K. Bush: I have a matter I would like to bring before the society before Prof. Pendergast leaves, and that is, that the surplus copies of our reports be placed in the libraries of the district schools. Many of them are building up libraries, and he knows where they could be placed to the best advantage. They make an up-to-date text book which is revised every year. It will be an excellent way of finding out what is going on in our agricultural school, and, again, if they wish to take up the study of wild flowers they have the best kind of text in the paper we listened to yesterday by the lady from Lake City. The reports would be excellent for reference, and I think they would be well placed if they were put in those libraries.

Prof. Pendergast: If I can do anything to help the matter along I shall be glad to do it. Of course, I presume those who applied first would get them, and only those would apply who were interested.

Sec'y Latham: How many such libraries are there in the state?

Prof. Pendergast: Over two thousand.

Sec'y Latham: It would be necessary to add something like that number to our published report and bind them all in cloth.

Mr. Bush: If that matter were brought before the legislature, I think they would be glad to give us the necessary assistance that those books might be placed in every school library in the state.

BEST THREE VARIETIES OF RED RASPBERRIES FOR HOME USE.

C. W. SPICKERMAN, EXCELSIOR.

It may make a difference in the minds of some how far we should carry the expression, "home use." Some time ago the society decided that the object of the horticultural society should be to cultivate and distribute the knowledge of raising fruit of the best quality, but there are times when for home use or market it is more a matter of quantity than it is quality.

But in considering the subject at this time, it seems as if we should suggest the varieties that are of a good quality and prolific bearers, and looking at it from this view I would say the Cuthbert and Marlborough are the best two varieties in general cultivation for home use.

The Marlborough is a strong grower, more hardy than the Cuthbert, a prolific bearer, and, with me, it is the very earliest. One may find a few ripe berries on the Hansel or Turner, but where I get my first picking is off the Marlborough, and they will bring in the general market twelve to fifteen cents a quart as quick as the Hansel or Turner will ten to twelve cents, and on damp, rich soil will produce in a season one-half more than the Hansel and one-fourth to one-third more than the Thompson's Prolific or the Turner. In regard to quality, some of my best home customers said they thought the Marlborough was the finest flavored of all the red raspberries they had ever seen, and when ordering berries for their table use they invariably ordered Marlborough as long as they lasted. They have a long bearing season, and for canning purposes they have a fine flavor, holding their color and shape well, perhaps, the best of any.

The Cuthbert is the strongest grower of all the raspberries in general cultivation and bears well down on the cane, which produces a large, fine berry, good for home use in any shape, and if one gets tired of raspberries three times a day they can turn the Cuthbert in the market for other kinds of fruit to a good advantage. The Cuthbert is a late berry and can not be counted on to enrich our breakfast tables with the first ripe raspberries, but in its season is one of the best. It is an abundant bearer of fine fruit of good quality, and a long keeper, also excellent for canning purposes. It is more subject to anthracnose and cane rust than the Marlborough. As to curly leaf, the two varieties are affected about the same.

If I were going to put out three rows of red raspberries in my garden for home use, I would put out the third row to Loudon. It is coming into considerable favor in our section, and so far has proved a strong resister of disease, and if it continues to resist those diseases that infest our best and most popular varieties, it will soon be our leading raspberry. It is not as strong a grower as the Cuthbert, but bears well down on the cane. One good feature of the Loudon is the fruit hangs well to the stem when ripe, and its bearing season is as long or longer than the Cuthbert. So far it has proved hardy and of good quality.

Mr. C. W. Sampson: Do you like the flavor of the Marlborough as well as that of the Turner?

Mr. Spickerman: Well, a good deal depends on the taste of the people. I may like the flavor of the Marlborough best and you of the Turner. I think the preference for raspberries is a good deal like the taste in apples. You may eat a sweet apple and like it very well and admire its flavor, but when you order apples for general use you order tart apples. We like a mess now and then of those sweet and soft berries, but on the whole I think the Marlborough is way ahead of the Turner or any other berry. Of course, there are exceptions to that rule, but I think the Marlborough is way ahead of the Turner as a canning berry, both in flavor and holding its color.

The President: Do you think the soil makes any difference? Do you think your location makes it possible to grow the Marlborough better than it could be grown elsewhere?

Mr. Spickerman: When I wrote my paper I intended to say something of my experience in heavy clay subsoil, and those who have had any experience with sandy soil might have something different to tell. I am not prepared to say how either variety might do in sandy soil. The Cuthbert needs a heavier soil, and you had better put the Cuthbert on high land and the Marlborough on low land.

Mr. H. F. Busse: I would like to ask Mr. Spickerman if he notes any difference in the yield between the Cuthbert and the Marlborough? Can you say which is the best paying crop?

Mr. Spickerman: I think the Marlborough is the best berry I have on the place. The Loudon is a new variety and has not had the test of a hard winter. The trouble with the Cuthbert in our section of country is its liability to disease, principally cane rust and curly leaf. The Cuthbert is more subject to the cane rust than the Marlborough.

Mr. J. C. Kramer: I have got an idea that the Cuthbert beats it all over and over, and you can protect it better through the winter. Of course, the Marlborough stands the winter to perfection, but these last two years I had a great deal of trouble with insects; one patch was nearly ruined. Last spring I cut off some canes and took them to Harris and he told me what it was. Since then I have found out from Green's little book the whole business—then I found out the insect myself. Otherwise, I have an idea that the Marlborough for general use is the best. It is hardy and a good market berry, but not as good as the Cuthbert.

The President: What are the best three varieties for home use? Which would you consider the best if you were going to plant any raspberries?

Mr. Kramer: I would put the Loudon at the head, but we have not had any hard winters yet to test it, and I could not say whether it is perfectly hardy. I have only had it one summer, and I could not say that, but so far as I can see it is about in the same line with the Marlborough, but the fruit is entirely different.

The President: Can you pick out three good raspberries that you could recommend for home use?

Mr. Kramer: Oh, no, I am not old enough for that; I could not say that. (Great laughter). (Mr. Kramer is 73 years of age).

PROPAGATING RED RASPBERRIES.

R. A. WRIGHT, EUREKA.

In taking up my plants I choose a cloudy day, if possible, in the latter part of October. I usually have four men to do the work, three to dig the plants and one to gather them up, cart them away to a convenient place and heel them in for the winter. It is my plan to dig the plants in such a manner that there will be from four to six inches of the cross root on the plant, and if by accident the main root is broken off we cast the plant aside as worthless. I firmly believe that plants taken from young beds are stronger and more vigorous than those taken from old beds that have fruited several years, therefore I plan to set out about an acre or more each year, thus keeping a supply of young plants. For this purpose I use my old strawberry bed, which is rotated out of office as soon as it is through fruiting the second year. I plow and harrow it and plant it to sweet corn for fodder, which always yields well. When the crop is taken from the ground, I plow again, this time as deep as I can, from eight to ten inches. In the spring as soon as the ground is dry enough, I harrow it well; then I cultivate it thoroughly with my twelve tooth cultivator with the rake attachment, which leaves the ground in excellent shape and ready for planting.

Plants cannot be too carefully handled while being moved and planted. I therefore throw some loose dirt into the bottom of the box of my two wheeled cart, and taking the plants from the ground where they were heeled in I fill the cart, placing the roots on the dirt, and then cover them with canvas to protect from wind and sun and take them to the field. I always use a line stretched across the field to set the plants by, thus making rows perfectly straight. In making the holes I use a long handled spade, which I place about three inches from the line, pressing it straight down into the ground about ten inches with the foot, working it back and forth until the hole is the proper size to receive the plant. My assistant follows

with a large pail of plants, which have been dipped into water. In placing the plant in the hole he spreads the roots lengthwise and presses the ground firmly on both sides of the plant with his foot, always drawing some loose dirt around the plant to prevent baking of the soil.

I vary the distance in planting different varieties; for instance, Cuthberts three by seven feet, and Marlboro, Thompson and Loudon three by six feet. I cultivate thoroughly the first year as late as August 15th, the second year I cultivate three times at the beginning of the season, after that using the hoe to keep the weeds down and let all the plants grow. This method in cultivating gives me a good stand of young plants.

I cultivate differently the new and expensive varieties,the Loudon, for instance; the second year I do not use the cultivator at all but keep the weeds down by hoeing and am careful not to disturb the plants. This method of cultivation gives me a great many more plants than I get when I use the cultivator the second year.

DISCUSSION.

Mr. Brand: Mr. Wright's soil is very loose. Would he do the same thing on stiff clay soil?

Mr. Wright: I have never had any experience with that kind of soil. My soil is about a foot and a half deep, and has a rich, heavy sub-soil.

Mr. Elliot: Is it high, rolling ground or level ground?

Mr. Wright: It gradually slopes to the north. There is a little flat and then a dip, then another flat and another dip, so it is really a little rolling. There are four acres that are perfectly flat.

Mr. Elliot: Do you find any difference between the plants grown on high ground and on low ground?

Mr. Wright: I get the best plants on low ground. I always do.

Mr. Sampson: You say you do not cultivate the second year when you want to get plants?

Mr. Wright: No, and I am well pleased with the trial. I got a great many more plants. I used a twelve tooth cultivator the first year, that did not cover so many plants, and the second year I did not u e the cultivator at all, and I have a very fine stand of plants.

Mr. Elliot: Do you use one or two plants in planting a hill?

Mr. Wright: When the root is a little short I put two in a hill.

Mr. Elliot: Do you always get a full stand?

Mr. Wright: I do not think I ever lost ten per cent, except one year.

Mr. T. T. Smith: When do you plant?

Mr. Wright: Usually in the spring as soon as the ground is ready, except this fall, when I set out about one and one-half acres.

Mr. Brand: What is the best variety with you?

Mr. Wright: The Marlborough by far. I have the Marlborough and Cuthbert on one side and the Turner on the other. I have a row of Marlborough between two rows of Cuthbert, and the Marlborough grows larger and stronger, and I get the best price for the Marlborough.

Mr. Brand; How about the Loudon?

Mr. Wright: My experience is light with the Louden, but the showing it has made so far pleases me very much.

Mr. Kramer: Would you not prefer the young plants just coming out of the ground to the ripe wood for planting?

Mr. Wright: I have never tried the young plants.

Mr. Kramer: I like the small plants with a large root; they grow right along and make good plants.

Mr. Wright: They do not with me; I always take the largest hill and the largest plant.

Mr. C. L. Smith: Do you cut the cane back close to the ground when setting?

Mr. Wright: I cut it back to about six inches.

Mr. T. T. Smith: You would not set out the red raspberry and leave the cane the whole length?

Mr. Wright: Indeed, I would not. I usually cut them about a foot short when I take them up, and then go over afterwards and cut them off with a sharp knife to within three to five inches. It is easier to set them out, and not much of a job to cut them out afterwards.

Mr. Kramer: Do you clean out the old wood right away, or wait until spring?

Mr. Wright: I clean it out just as soon as I can after picking. Perhaps I might tell you about this Loudon planting. In the year 1896 I bought 100 plants of the Loudon and set them out very carefully, and I lost thirty out of the hundred, which only left me seventy plants. I got enough young ones to fill out the bed, making it perfectly full, containing one hundred plants. Last spring, 1897, I saw plants coming up quite thickly. I had only seventy full plants to begin with, and this year I took up over 4,000 nice plants from those seventy original plants. I have read that running the cultivator through once or twice in the spring will cut out the roots and increase the number of plants. I do not believe that.

Mr. Kramer: I have set those young plants and set them in the spring. Of course, they have to be set in the spring, as you get such dry weather in the fall they would not grow. You take them up in the spring and plant them right out and cover them up well, and they will grow well and make nice plants.

Mr. Elliot: How long are your plants coming into full fruiting?

Mr. Wright: The third year.

Mr. Elliot: You get a partial crop the second year?

Mr. Wright: Yes, sir.

Mr. Elliot: The first year after planting you do not get any fruit?

Mr. Wright: There is so little of it I do not pay much attention to it. It is a hard matter to get pickers to go over them; there is not enough fruit to pay me for having it picked.

Mr. Elliot: Have you ever thought of the method of putting three plants in a hill and getting a full crop the second year?

Mr. Wright: I have thought of it, but I do not think the plants are large enough to make a full crop, and then you get too many roots if there are three or four plants in a hill after they get several years old.

Mr. Elliot: That is a point I would like to have discussed here—in regard to planting three plants in a hill. I have a theory of my own in that respect, and I would like to hear that point brought out and discussed.

Mr. Harris: Mr. President, just one moment. If you are going to grow raspberries for fruit, put in your cultivator just as soon as you can in the spring. If you are propagating raspberries for plants then do not cultivate at all. Those bushes that you put the cultivator in are going to raise plants early, but you get only about half as strong plants as if you let them alone. They have the whole season to grow in. We had a perfect crop on plants set out last spring, and they bore right on up to the middle of October.

Mr. Elliot: I have been making some observations in regard to growing raspberries the last four or five years. I have had occasion to visit quite a number of places in northern Minnesota where they make a success of that kind of fruit, but I noticed that nearly every one of them planted only single canes in the hill, and many of them have a great many vacant spaces in their rows the first season, and they have to fill in those vacancies the next fall or spring. Now, would it not be better to plant two or three plants in a hill and have a full stand to start with? If, as the first gentleman states, there are too many roots in a hill, it is an easy matter to cut out one or two plants. If I ever am so fortunate as to be able to grow raspberries, I should try the method of putting two or three plants in the hill, according to the strength of the canes.

Mr. Busse: If a man starts a raspberry patch he does not intend to buy two or three times as many plants as he wants to set out that patch with and then have to pull them up again. If the plants are not well matured, as they were in 1895, then one is not enough. If plants are scarce, a man does not want to put so many in a hill, but where a man raises his own plants he can set out as many as he wants to. I think Mr. Elliot is all right.

Mr. Elliot: If a man has not enough plants to set out a piece of ground properly, why not set out less ground?

Mr. Jewett: It seems there is no one here who has had experience in that line, that is, experience in setting them in that way. I think one objection would be that we would have such a large number of vines we would not know what to do with them. I had a patch of berries that came so poorly I was about abandoning them, and finally my son suggested that I take some young plants and set them out. I went to the berry patch and took the new shoots from that same year and planted them, and this year we have from seven to eight canes in a hill, as high as my head; the rows are planted six and one-half feet apart and the plants four feet apart in the row. They average eight canes apiece, and if we had set three plants we would have had so many we would not know what to do with them. We have so many canes now we have to cut them out. These were set in July, and they grew right along without watering, and it was not a very wet season. When they reached the height of eighteen inches I cut them off, and those canes are now about as high as my head. Imagine the result if we had put in about three times as many plants.

The President: I think Mr. Elliot's ideas are good. We do not want to waste land, and we have followed the planting of raspberries the old way long enough. Planting raspberries seven feet apart is time thrown away with us. If I could get plenty of plants, I would plant them three and one-half feet apart. It is easy enough to kill out plants in this country. What you want is to occupy all the ground. Mr. Elliot suggests you can have strong bushes by setting two or three plants in a hill; his idea is to have a perfect stand. It is an easy matter to take out the plants if you do not want them, but it is harder to start plants after the plantation is under way. We have eight or ten acres planted, and we follow the plan of putting the rows three and one-half feet apart, letting them grow two years and then taking out every other row. We get quite a nice crop of berries the second year. They are on very rich ground where they get a good strong growth. I should think others might kill out plants as easy as we do.

Mr. Harris: I would advise setting two strongly rooted plants, and if not very strong then set in a third one. We have adopted the plan of setting the rows of blackcaps twice as thick as we want them and then taking out every other row the second year.

Mr. Wright: It would be a good thing for the nurserymen to follow that plan. (Laughter).

The President: I think the nurserymen would be willing to compromise and put in two where they are weak. The thought Mr. Elliot intends to bring out is to have a perfect stand. It is better to have an acre with a full stand than to have two acres with only half a stand.

Mr. Pond: Would not a weak plant be more apt to die if there were several in a hill than if there was only one?

The President: I have not had that experience. I do not think it would be necessary to plant them all in a bunch; you could spread them out. You plant three kernels of corn, and you want at least two of them to grow. If you plant only one, and it should happen not to grow, you would be out a hill of corn and waste just that much land. If you plant two raspberry plants and both of them grow, cut out one, if you do not want it.

Mr. C. L. Smith: I have tried both ways of planting. I have had such good plants and so well planted in a favorable season that the plants were too thick in the row. I have also had such poor plants and so poorly planted that there were not nearly enough plants in the row, and I would rather wrestle with a dozen rows where the plants are too thick than with one where there are not enough.

Mr. Lord: I have been cultivating raspberries for about twenty years only, and I have always followed Mr. Elliot's plan. I take a spade in planting, drive it down, then put a plant at each end and one in the middle.

Mr. Kramer: That is the way we go to work to make a new plantation. We get much better results in that way.

The President: It seems to me we ought to be able to tell when a plant is in good condition, and it makes no difference whether a

man has been planting for twenty or thirty years, or a man who has just started in the business. He ought to post himself so he will know whether the stock is in good condition. It is not a difficult thing to do, and it is a strange thing to me that people will not stop to think whether the plant is in proper condition to set. It might be it is not in proper condition today, but it can be put in proper condition. I think there is too little attention paid to that. The same thing holds good in the raspberry and strawberry plant as in the cabbage plant. I think gardeners who make a business of growing vegetables are more intelligent in their work than the people who grow fruit. In planting fruit, people generally put in the plants when they have time or when it is convenient, no matter what the condition of the plant may be. If gardeners get a plant that is not in good condition they throw it away. If a plant is out of condition it might be put in condition before planting and thus not have the plant a total loss.

SINGLE DAHLIAS.

In our search for plants for garden decoration, where continuous display is desired, we should not overlook the single dahlias, as they have no equals in the long list of annuals in point of usefulness, either for the garden or house decoration. While it is a vigorous growing plant, producing tubers as strong if not stronger than the double sorts, it gives the greatest satisfaction when grown from seed, providing always the seed has been saved from the choicest varieties.

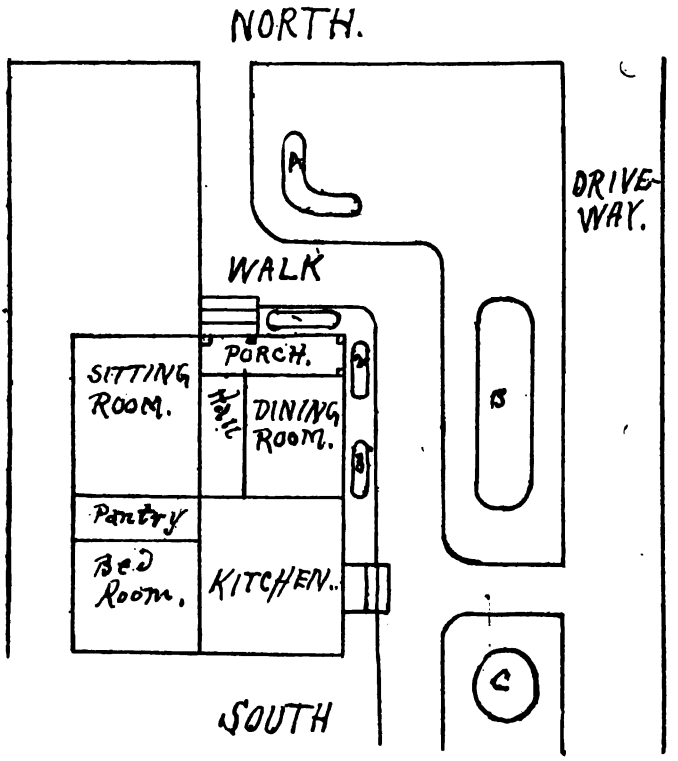
Seeds sown in a frame or hotbed, or even in pots in the house, early in April, make splendid flowering plants in September, which is as early as dahlias should come into flower under any circumstances, if the best results are to be obtained, as the dahlia does not delight in our hot, dry summers. We advise the saving of a few roots of the very best varieties, and of plants of the best habit, from which we can save seed, but where a large mass is required depend wholly upon seedlings, which should be planted about one foot apart in rows three feet apart and then discard the poorer ones, of which there will always be a goodly number. These can be thrown out when the first flowers appear, and the others will soon spread themselves sufficiently to cover the ground. The certainty of securing some really choice flowers and the reasonable hope of getting a few superior ones, adds a great charm to the cultivation of this, like that of other flowers of a similar nature. We have always grown the single dahlias as annuals, and have no flower in our garden we value more highly.

HINTS ABOUT LOCATING FLOWER BEDS ABOUT THE FARMER'S HOUSE.

MRS. JENNIE STAGER, SAUK RAPIDS.

We will suppose the kitchen of the farmhouse has a southern exposure, which should always be the case when possible, as the women on a farm have to pass a great part of their time in that room, and sunshine not only helps the flowers, but is a great factor of health for woman-kind as well. Therefore, we should have the full benefit of it in our houses.

I have made a small drawing, showing how the surrounding yard could be utilized for flowers, and it may give a better idea than oral directions. In front of the sitting room, and on the northwestern side of the house, is an unbroken plat of grass. At the turn of



SUGGESTED PLAN FOR FARMER'S HOUSE AND GROUNDS.

the walk in front of the house could be a bed (1), which might be of an oval or diamond shape, or conforming to the lines of the walk. In the long spaces each side of the dining room window may be two beds (2) and (3), leaving a foot or so of sod on each side of them between the house and the walk. Portulaca, phlox and petunias would thrive well in them.

In the lawn between the driveway and house could be a large bed, oblong in shape, from ten to fifteen feet wide and twenty to twenty-

five feet long. Tulips, lilies and herbaceous plants, many of which come in bloom long before we can have blossoms from annuals from seed, might be planted here. Monthly roses would also look well in this bed, as it is in full view from the kitchen and dining room windows, and it would certainly be a thing of beauty and a joy for ever.

Another bed of any desired form might be placed on the opposite side of the walk from the driveway to the kitchen. It would be very desirable to plant hybrid perpetual roses on the lawn and, perhaps, a very few flowering shrubs, singly or in groups, not too far from the walk and without formal arrangement.

THE WINTER OF 1897-8.

WM. CHENEY.

The following meteorological record for February, 1898, and results for the winter are furnished by William Cheney, voluntary observer, United States Department of Agriculture, weather bureau:

This was a warm February, being four degrees warmer than the average of February for 33 years, and we have had only six as warm Februarys during that period. It had just about the same mean temperature as February of last year, and, with the exception of 1892, 1896 and 1897, was the warmest February since 1882, which was nearly six degrees warmer. The first two days were the coldest, the minimum being reached February 2. This was followed by very much milder weather, from February 6th to 13th inclusive, during all of which days the maximum rose from two to twelve degrees above freezing point. No snow fell in sufficient amount for sleighing until February 19th, when four inches were deposited, badly drifted, which, in addition to the snow of February 14th, gave us the first good sleighing of the winter. This was worn out in a few days so that the last of the month found us without sleighing.

A statement has been made that the winters of '77-78 and '78-79 did not produce a single day of sleighing in Mankato. This is not true in Minneapolis, for we had a few days of sleighing in the first week of December, 1877, and two days the last of January, 1878, and February 19th, 1879, we had the first sleighing that winter.

The winter just closed was five degrees warmer than the average for 32 years, and we have had only four warmer winters during that period.

Daily observations gave the following results:

Mean temperature of the month	19.0
Maximum temperature of the month (8th)	44.0
Minimum temperature of the month (2nd)	—15.0
Range of the month	59.0
Highest daily mean (11th)	34.0
Lowest daily mean (2nd)	—6.0
Greatest daily range (18th and 22nd)	25.0
Least daily range (11th)	7.0
Mean humidity	0.64
Mean height of barometer, corrected for temperature and elevation	30.155
Total water deposit, inches	1.79
Greatest precipitation in any 24 consecutive hours (10th)	0.80
Number of days on which .01 or more precipitation fell	7
Total snowfall of the month, inches	9.9

Clear days, 10; partly cloudy, 8; cloudy, 10. The prevailing winds were from the northwest.

Comparative temperature of February for 34 years:

1865	23.37	1882	24.97
1866	6.80	1883	9.47
1867	14.11	1884	8.78
1868	12.72	1885	6.02
1869	17.58	1886	14.31
1870	14.88	1887	9.05
1871	17.90	1888	11.54
1872	17 38	1889	10.45
1873	10.65	1890	17.48
1874	10.67	1891	10.78
1875	2.62	1892	20.86
1876	14.10	1893	9.40
1877	29.94	1894	13.60
1878	29.68	1895	9.80
1879	11.42	1896	20.40
1880	17.80	1897	19.20
1881	13.11	1898	19.00

Average mean temperature of February for 34 years..... 14.70

RESULTS OF THE WINTER.

Mean temperature of the winter 1897-8	18.53
Maximum temperture of the winter 1897-8 (Dec. 9th)	46.00
Minimum temperature of the winter 1897-8 (Dec. 2 and Feb 2).	—15.00
Average mean temperature of winter for 32 years	13.53
Total snowfall for the season	9.9

THE BEST FORM OF ORCHARD FOR MINNESOTA.

J. A. HOWARD, HAMMOND.

The average Minnesota farmer who has a good location and soil that is as well adapted to raising the hardier kinds of apples as the soil of southern Minnesota, should have an orchard of from 100 to 200 apple and plum trees.

In making up the list for planting, I would include those that sell readily when the farmer has a surplus to dispose of, and give the Wealthy the preference till we find an apple that is equal to it in every respect and a better keeper.

In an orchard of 200 apple trees I would plant 100 Wealthy, 30 Duchess, 30 crabs and hybrids and a dozen each of Patten's Greening, Hibernal and Longfield, and a few of the less hardier kinds if there is room for them in the orchard.

Plant the apples from sixteen and one-half to eighteen feet apart and the crabs not less than twenty feet apart. I would plant the crab apples on the south and west, and the Wealthy on the east, as they need some protection from the hot southwest winds.

I think an orchard on every farm would give as good returns in dollars and cents, if properly taken care of, as anything the farmer raises, at least I find this to be the case.

HOW TO GROW AN EVERGREEN WINDBREAK IN WESTERN MINNESOTA.

D. T. WHEATON, MORRIS.

Mr. President and Fellow Members:

When this topic was assigned me, I told the secretary I could not tell him anything by experience as to evergreen windbreaks in western Minnesota. There are but few groves of evergreens in the western part of Minnesota. And I want to say the little experience I have had was in setting out trees around my own buildings.

The first requisite for an evergreen shelter belt is a fixed purpose to have one and not to be discouraged because of failure at the first or second time of trying. It is very necessary to plan and prepare for the planting and not to go at it in a hap-hazard way and hope the trees will grow, and if they do not to wonder why and blame somebody else for the failure and to declare it is no use in trying for they just will not grow. If all, or even half, the evergreen trees that have been set out in western Minnesota were growing, there would be no need of urging the planting of more evergreens, as there would be many groves, and the benefits would be so appreci ated and be so apparent to everybody that many others would go and plant shelter belts.

Before planting evergreens, the ground must be thoroughly prepared. If the land is sandy but little preparation is necessary; but for prairie land in general, the sod must be well rotted and the ground subdued by cultivation. A crop of corn or potatoes the previous year is a good preparation. Plow deep and drag thoroughly so that the soil is in good tilth.

Order the trees early in the season from a reliable nursery—the nearer home the better—get small trees from twelve to fifteen inches high that have been transplanted one or more times, as a transplanted tree has better roots. Buy good trees; it is a false economy to buy second or third class trees, the difference often being the measure of success or failure.

Above all things do not purchase forest seedlings from some itinerant tree peddler, who has hauled the tree about for a week or more, for the probabilities are that not ten per cent. of the trees are alive and that not one per cent. will grow. It is surprising how many of these forest tree seedlings are sold and planted every year—most of them are set out in a little hole dug in the sod. Is it any wonder that people say that they cannot make evergreens live, when they try setting these forest seedlings year after year? Some deciduous trees will stand a good deal of neglect and still live and grow; the roots of an evergreen are very sensitive and require the utmost care. All conifer have a mass of fine roots, especially after being transplanted, and the roots would necessarily dry quickly. As soon as dug a resinous sap exudes from the roots, and if exposed to the dry air or sun this will harden, and if the exposure is for any considerable length of time the trees will never grow.

As soon as the trees arrive—which should be before or just as the buds are starting—unpack and separate, and puddle or dip in water and heel in in moist ground in a shady location or under cover for a protection from the sun. When ready to set out, if possible select a cloudy day, so as to avoid exposure to the sun. The trees should be carried in water for protection and to keep the roots moist.

In planting, dig large holes, and fine soil should be put carefully around the roots and firmly pressed down, so that the roots will be brought in contact with the soil. If the soil is at all moist, it is best not to use water.

The top soil should be left loose, and a fine mulch should be spread over the ground for retaining the moisture. Coarser mulch will answer as the trees get larger. Cultivating the ground may be as good, but I believe mulching to be the best. The mulch should be thick enough to keep the weeds from growing. If the trees can be sheltered from the wind and sun, I think it advisable to do so. Care should be exercised in not planting too near large deciduous trees, whose roots extend out a long distance, as they are great suckers of moisture. I believe many evergreens have been killed by being set too near other trees.

If evergreens are set near deciduous trees for a protection, they should be far enough away so that the moisture will not be extracted by the roots of the large trees.

As to the best varieties of evergreens to plant, the Scotch and white pine and the white and Norway spruce seem to do as well as any. I presume other varieties may do as well.

If a windbreak is wanted at the earliest date possible, the trees should be set close together, six or eight feet, but much further apart if the best shaped trees are desired. Double rows will make the best windbreak. Whatever trees are set, and whatever method is followed in caring for them, and however good the care, many times failure will be the result; at other times, with poor or indifferent care, or even with total neglect, success will be the result.

Over twenty years ago the St. Paul & Pacific Railway company (now the Great Northern) inaugurated the plan of planting trees along the line of its road, and at a number of its stations set out groves of several acres of different varieties of trees, deciduous and evergreens. Morris was one of these places. The railway company failed, and the trees were left to themselves. It was a struggle with grass and weeds, but the trees came out ahead, and the Scotch pine and white spruce still stand and are thrifty, standing over thirty feet high and are a foot or more in diameter. This is an illustration of how evergreens will thrive with neglect.

The finest grove of white spruces in this section were thoroughly mulched with straw. The trees are very thrifty, and they are about twenty-five feet tall; the limbs are thick to the ground. Last winter the snow drifted nearly over the tops of the trees and broke some of them down, and others were stripped of their limbs.

DISCUSSION.

Mr. C. L. Smith: Those trees were very closely planted, were they not?

Mr. Wheaton: I cannot say about that.

Mr. C. L. Smith: About twelve years ago we had the same question up about close planting, and I was there to examine those same trees, and I found they had been planted two feet apart in the row; the thick planting was what enabled them to do as well as they did without cultivation.

Mr. Brand: Was that a single row of white spruce, or was it a clump of them?

Mr. C. L. Smith: It was a clump so close that nothing could have crawled through them.

Mr. Cook: Were they in an exposed position?

Mr. Smith: Yes, there was nothing else around to shelter them.

Mr. Dartt: The white pine would have done as well.

Mr. T. T. Smith: In the course of Mr. Wheaton's remarks he spoke of planting trees too close together. I would like to ask him what distance he would suggest planting evergreens for windbreaks?

Mr. Wheaton: For a good shelter belt I think from eight to twelve feet is close enough, if you have two rows from twenty to forty feet apart.

Mr. T. T. Smith: I had some Norway spruce that were planted in 1872 that continued to grow and never lost a branch; others were trimmed quite free from the ground and died, and those that were not trimmed at all lived. I planted them in clumps about ten feet apart, sometimes twenty in a clump.

Mr. Dartt: In this paper we have a statement of facts in favor of the Scotch pine, and I want to offer another fact. I have a windbreak of Scotch pine on the west side of the tree station at Owatonna; it is not a very long one, but it is a windbreak, nevertheless. It was planted about eight or nine years ago. I planted a single row of Scotch pine. They were set about four feet apart in the row, and they were allowed to come pretty close down to the ground, and they have grown up so that that single row would make a pretty fair windbreak where the snow would drift in pretty deep; it would hold a drift ten feet high—just one single row. But I would advise planting two rows and planting them six to eight feet apart in the row. Cultivate them a little and get them started right, and you will have a good windbreak.

Mr. Harris: My old theory of planting evergreen windbreaks used to be to plant the trees in the row, four to six feet apart, putting the rows about eight feet apart and breaking joints, but it makes a better windbreak if planted in one row, and if planted four feet apart it would be better to remove one-half of them. If you are going to have double rows, I would have them twenty feet distant instead of six.

Mr. Wedge: I am a good deal interested in this question. I confess that ten years ago I knew more about the evergreen business than I do today, and even three or four years ago I thought I knew the Scotch pine was adapted to any situation in Minnesota. At the

end of the droughty period, which ended about two years ago, my Scotch pine were in very bad condition, and I lost quite a number of my older trees. They became so disreputable in appearance I dug up more than three-fourths of them. I noticed this about it, though: those that were in exposed situations, where they had the full benefit of the southwest winds, were injured much more than those that were sheltered. I have windbreaks planted as Mr. Harris said he had some planted—in double rows. The row that was planted to break the west and southwest wind is in bad condition; they were planted twelve to fourteen years ago. Another row, on no better ground, but sheltered better, is in fine condition today—looking very nice, indeed.

We are neglecting one tree, an old-fashioned tree, one that I was very much disgusted with after our hard winters, but still it lived through them, and today it is looking better than any kind I have on the place except the mountain pine, and that is the Austrian pine. I am going to study up on this Austrian pine, because it is the best pine we have on the place. It holds its lower foliage better than the Scotch pine and endures the drought favorably, where the Scotch pine were ruined and we had to dig them out.

Just a few remarks on the different pines. Mr. Smith makes a point of Minnesota trees for planting, but that is very far from being perfect. There is the mountain pine, which is not a native of Minnesota, and there is nothing hardier. I do not know where it came from; I think Judge Moyer stated it came from the Alps. I think we have a better form of the white spruce than any that grow in Minnesota,and that is the Black Hills form; it is a form of the white spruce, with a good deal broader foliage, and it behaves better than the ordinary spruce. It is different from any other form of white spruce, and it has stood so well in northwestern Iowa that I feel confident that it will be better than our Minnesota spruce, although the white spruce is a great favorite of mine.

I was quite interested in the behavior of the jack pine at my place. Last year I received five hundred from Mr. Ayres, in the northern part of the state. It makes a remarkable growth. I am a warm friend of the red cedar, and I do want the comment made on it in regard to its being a slow growing tree corrected. Where it is under cultivation during the first ten years, it will keep up with any of the rest. I know it is the northern red cedar, because it was sent to me from the Minnesota river by a friend of mine.

Prof. Green: About the jack pine—it is found on the driest land in the state of Minnesota. I look on the native pine of Minnesota and group them in this way, in three sets: The white pine is found on good land, but land retentive of moisture, not on very dry land. On what you might call drier land you find the Norway getting ahead of it, and on the very driest land in this state the jack pine will crowd the Norway and white pine. The jack pine will not live on the good land, but the others will crowd it out. In Cass and in Crow Wing counties, on that dry land, you will find the jack pine where nothing else will grow. I noticed in reading over the differ-

ent forestry reports they had better results in transplanting the jack pine at the foot hills of the Rocky Mountains in Nebraska, where the land was so loose they did not dare to cultivate it. On our plantation on the Coteau Farm in Lyons county, we have found the jack pine growing better and stronger than anything we have set out. It grows very rapidly indeed, but when it gets old it looks kind of scraggy; but I confess I have got a soft spot for it in my mind. I am speaking of the very dry situations in the southwestern part of the state. I might say another thing, that in our experience down there in Lyons county, with that exception, it is not safe to plant evergreens until you have a windbreak for them. It is not safe to plant Scotch pine; they will kill out with the northwest winds, which will destroy the foliage. I think we had a little better results with the bull pine, especially as to its standing the cold spring winds. We had more trouble from that than from anything else.

Mr. C. L. Smith: That is a good point Prof. Green made about having other trees started. If I were to tell a farmer to set out evergreens, I would tell him to first start a windbreak of deciduous trees, four, six or ten rods away.

Mr. Dartt: What kind?

Mr. C. L. Smith: Box elder, white willow—well, those are the two best for that dry section. The cottonwood is no good; it will not stand the drouth. I should prefer the Minnesota tamarack. That is a successful growth of Scotch pine Mr. Wheaton speaks about It had four or six rows of European larch on the west side of it.

Mr. Dartt: I have had experience with the cottonwood, and in our section it is a rapid growing tree, and it does remarkably well. The Austrian pine with me has been reasonably hardy, a very slow grower, but I think not quite as hardy as the Scotch.

Mr. Harris: I do not think it is as good as the Scotch.

Mr. Wedge: I would like to ask if any one noticed that their Austrian pine stood the drouth better than the Scotch.

Mr. Brand: I have no hardier or better tree than the Austrian pine, and if the gentleman will come to my place I will be glad to show them to him. In reference to the point made in regard to the hardiness of the three classes of seedlings, the professor gives the white pine as growing on the moist land, the Norway on the next drier, and the jack pine on the driest. Am I right?

Prof. Green: On moist land the white pine will crowd out or suppress the others, and next the Norway will suppress the jack pine.

Mr. Brand: I think that is correct, but if that reason is correct it is something we can overcome. The reason why the white pine succeeds better on that kind of soil is because the conditions for germinating the seeds are the best, and the reason the Norway pine succeeds the best is because the seed finds most favorable conditions there. It is the same with the jack pine, it finds the most favorable conditions for germination in the driest parts of the soil. You take any one of those three varieties and transplant them, give them a fair start and they will do equally well. I should prefer the white pine to any of the others. Now in regard to the tamarack. We naturally expect to find it entirely in the swamps, and yet when

I was north looking for forest trees in 1882—and I spent a good many days there—the best tamarack I saw in that entire country was on dry land. Then I argue from that that the reason we generally find them in the swamps is because the conditions on the dry land are unfavorable for the germination of the seeds, and it does not get a start.

Mr. Dartt: Yes, I had forgotten; I knew I wanted to speak about something else, and it was a point in regard to the tamarack I wanted to make. Tamarack does not make half the growth the European larch does, and it has killed out in a favorable locality, while the European larch is an open tree—and I just want to put in this word for the European larch, I believe it is the best tree we have got. It will grow rapidly, and it grows in an erect form, and I think it is really *the* tree, but with me it has been a little difficult to transplant; it might not be so with others. They say we must transplant early in the season because it starts early, and I have tried that, but I have had rather poor success in transplanting the European larch. Nevertheless, I want it understood by everybody that it beats the tamarack clear out of sight, and it beats a great many other trees which we call good.

Mr. T. T. Smith: In 1872 I sent to Douglas for 1,000 European larch; they were nothing but whips, but today they stand forty feet high.

Mr. Wheaton: In regard to the European larch Mr. Smith has spoken about, those trees were planted thick, you could not go through the growth, and part of that growth is still growing so thick that a chicken can not get through. It was on railroad property, and everybody went in and helped himself, but some of those trees remaining are a foot in diameter.

Prof. Green: I have been a good deal interested in finding out the natural locations where trees in this state attain the largest size, and in studying the tamarack I found that while we have immense areas of tamarack, it does not reach a large size in the swampy area. There is a swamp north of Duluth, it is sixty miles across that tamarack swamp, it is one of the largest tamarack swamps I know of, and while there are some good sized trees there, yet I found that of some of those tamaracks it took seven ty-three years to make a tree one and one-eighth inches in diameter I had to use the microscope to find the growth. You take the muskeag swamps of northern Minnesota, and you find the smallest trees in the center, but as you get near the edge they increase in size, and as you get on the higher ground, but where the roots get plenty of moisture, you find the biggest tamarack. This is so in this state, and on the wet land you cannot find a tree of large size. I think the fact that Mr. Smith states about the European larch is very encouraging. Mr. Smith says he has a clay subsoil. We have a porous subsoil. We lost all we had in our forest plantation in the summer of 1894. They could not stand it, and we lost white birch and others, but not near so bad as the European larch.

Mr. Lyman: I have a row of European larch that I planted out thirty years ago, some of them are fifty feet high and twenty-five inches in diameter at the base; they have grown well.

SWEET PEAS AND THEIR IMPROVEMENT.

WYMAN ELLIOT, MINNEAPOLIS.

This is an annual, free-growing, flowering vine, which at the present time is very highly prized by amateurs and commercial florists for its many colored, fragrant-scented blossoms, and is deservedly one of the most popular annual flowers that is grown in the garden. In its season its flowers are more sought after for decorative purposes by the gentler sex than any other, the rose excepted.

When I looked over my library to see what others had to say at an early date about this annual, I was somewhat surprised to find how little had been written about what is now one of the most popular flowering annuals in the garden; for instance: in "Parlor and Garden," by Edward Sprague Rand, Jr., printed in 1864, comprising four hundred and eight pages descriptive of desirable plants for the flower garden, the whole of four lines was devoted to the sweet pea.

Within the past few years there has been a wonderful development of the possibilities of what was once considered but an ordinary flowering annual; the change wrought has taken years of diligent thought and energy by some of the most distinguished propagators on this and the European continents, to bring this much admired and very popular flower to the degree of perfection which it has now attained.

SOIL AND CULTIVATION.

The sweet pea will grow in any rich soil, though they are more productive and remain longer in full bloom in a deep, loamy, retentive soil that has been deeply cultivated. In preparing the ground, it is preferable to have it well enriched with thoroughly decomposed manure, excluding all that possesses the least fermentation. Spade or plow in quite deeply the previous fall. This gives the soil a chance to become well compacted, and if very light and sandy when the drills for seed sowing are made I tread in them with both feet, making the soil very firm. In planting I prefer double rows, one foot apart, using one trellis for the two rows, each two rows five feet from the next two, and made running north and south rather than east and west, that the sun may shine equally on each side. The seed should be sown for the first crop as soon as the ground can be easily worked in the spring, in drills three inches deep, quite thickly in the rows, that no vacancies may occur from loss of plants by cutworms or otherwise. It is much better to thin the plants by pulling out those of weakest growth where they are too thick than to replant later and have an uneven growth.

The seed should be covered one and one-half to two inches deep and the soil well firmed over them. As the young plants appear above ground draw fine soil toward them, and as growth proceeds hill up about two inches. At this time unleached ashes, sown at the rate of one bushel to each two square rods of ground occupied, will prove very beneficial, and when the vines are six inches high, form an irrigating trench, eighteen inches from the rows, to be

used in case of a severe drought, by raising a ridge of dirt three inches high. Fill this with a mulch of old, decomposed manure made very fine. This seems to keep the ground cool and moist, and with each successive shower of rain or wetting by artificial means, the enriching qualities of the manure and ashes are carried to the roots of the plants, and if the blossoms are closely picked, letting none go to seed, they will yield continuous bloom until the frost kills the vines.

The after cultivation of keeping the soil loose and well worked between the rows should be a cardinal feature and should not be neglected all through the season. This is very easy if proper mulching, free from weed seed, has been provided, only pulling out here and there any weeds that may appear.

SELECTION OF SEEDS.

In the selection of seed I shall not give a long list of named varieties, for there are very many new kinds. Each admiring, enthusiastic collector has his preferences as to color and variety to grow, every year the seedsmen and florists catalogue new sorts, and if we were to believe all their glowing descriptions about new varieties and favorites they would appear far superior to any before presented. The old adage "The new broom sweeps clean the pocket" is true as to the fancy price paid too often for the many new things, when some old, tried, cheaper kinds would be equally as good and frequently give better results.

After trying many of these new high priced novelties, and in many instances meeting with but indifferent success, I have thought best to stick to that good old tried sort, the Painted Lady, or Apple Blossom, for a main crop, which for all climates of short seasons possesses more points of excellence, all things considered, than any other variety with which I am acquainted. The past season, when tested alike in parallel rows beside those grown from California seed, it proved to be two weeks earlier and much more prolific. I never had finer sweet peas in vine and bloom, especially those grown from my own raising of seed.

I procured the seed of this variety originally from an old Frenchman, an enthusiastic amateur cultivator of the sweet pea, who, when living, I noticed, always had the finest sweet pea blossoms of all the cultivators in the city. This strain of seed I have endeavored to keep pure and to improve their blossoming qualities by selecting seed from those that have three and four flowers to each blossom stem.

I find, as a rule, not only with the sweet pea but with all classes of fruits, flowers and vegetables that, unless continual care is exercised in selecting seed from only those plants that are the most productive and show the greatest number of good qualities, the stock will soon degenerate and become unproductive.

Another point in the selection of seed to which I wish to call your particular attention that applies to a great variety of plants, is that the transition of seed from a southern climate with a long season of growth to a northern climate with a much shorter season, in many

instances, proves disastrous in results obtained; therefore, it is prudent to be somewhat cautious in selecting seeds or plants of slow maturity for a climate with short seasons like ours.

TRELLISING.

One of the most essential things to be provided in the cultivation of sweet peas is a good trellis upon which they may climb. After several years of experience with different material and methods, I find the best and most lasting structure upon which to train the vines is poultry wire netting six feet wide, this fastened at each end to posts made from old gas pipe one or two inches in diameter and of a length that, when driven into the ground two or three feet, the remaining part will be the height of the middle of the wire netting. After the netting is stretched and fastened to the end posts as taut as possible, drive a strong three foot stake firmly into the ground in line with the row, four feet from each post, to which attach a strong double wire; bring it to the top of the posts and securely fasten there; put a stick between the double wires and twist to take up any slackness or sagging in the netting. If the rows are long the trellis should be strengthened by using strong stakes every eight feet, driven into the ground with their tops even with the top of the wire, and to prevent swaying back and forth by strong winds put a wire brace over the top of the trellis at intervals along the row, each end of which fasten to two strong pegs driven into the ground six inches outside of the rows.

A trellis made from wire netting and second-hand one-inch gas pipe will cost four to five cents per lineal foot for material. This I consider the cheapest lasting trellis and one that will not need renewing for many years if carefully taken down at the end of each season, rolled up and properly housed.

REMEDY FOR THE TREE LOUSE.—The following proved a perfect success with me in destroying the leaf louse on young trees, where the limbs could be submerged; have not tried it with the spray:

Dissolve by boiling two-thirds of a bar of Santa Claus soap in twelve quarts of water, and use as soon as cool enough to hold your hand in it. Dip the branches in and then shake them gently.

I tried this on my nursery stock and young plum trees the past season, and not a live louse could be found two days after. It did not injure the foliage at all.

I would be glad if others would try this and report.

Excelsior, Minn., March 6, 1898. A. D. LEACH.

PLANTING AND CULTIVATION OF THE PLUM ORCHARD.

OLIVER GIBBS. JR., MINNEAPOLIS.

This subject is very much like a plum thicket itself. I would rather skirmish around it for an hour than go into it for even five minutes, and for an open confession let me say I shall bring a large amount of ignorance to bear upon it—how large that is, you may estimate when I mention one item of it, which is, that I do not know why it is that at this time, about twenty-five years since the Desota was introduced, our markets are still unsupplied with this or any any other good native plum—a fruit that it is and always has been hungry for and willing to pay a high price for if offered in proper condition.

I have watched the native plums for twelve years past on my farm in South Dakota, where there have been thousands of them around me, of many varieties and on different soils, elevations, exposures, etc., and my conclusion is that they are worthy of more careful study than anybody seems to have given them, and that when horticulturists find out about them what there is to be learned, by that study we shall discover that we have a Klondyke in all our gulches. The main study lies in the blossoms.

In their native situations they are found growing best on deep alluvial soils or in gulches where they are receiving deposits of the surface soils brought down from adjacent uplands by winds and washes, but they do well on uplands, properly prepared by deep plowing or subsoiling. For good fruitage, they want plenty of sunlight and good air drainage. Frosty situations are to be avoided in selecting the orchard site.

Planting in groups is an imitation of nature's method, but I prefer straight lines for convenience in planting, cultivation, gathering the fruit, etc. I would place the trees not more than ten feet apart in the rows and the rows not more than twenty feet apart. This is about as far as the plum pollen is supposed to drift alive from one tree to another. I would mix up the varieties so as to have every other tree a strong, constant pollenizer, and would be as careful as possible to have the alternates agree with each other in their social habits of season and intermingling in the bloom. The Desota and the Miner are examples of this.

I would give clean fine cultivation, keeping it up throughout each season, year after year, till the shade covers the ground in the rows and the most or all of the space between the rows. I would have the trees headed high enough to get under the branches with the scythe, and then mow over the ground closely every year in June, July and August, so as to have the surface fine and clean for harvesting. I would fertilize with wood ashes or barnyard manure, one or both, but rake all lumps and rubbish, if there are any, away from under the trees, before the picking season begins.

I would impound the chickens in the plum orchards, and perhaps the little pigs also, but have no pigs in there large enough to break up the roots and multiply root sprouting. At the New York agricultural experiment station I was shown a small orchard of European plums, fifteen years ago, which the director told me had been

kept entirely free from the ravages of insects by using the orchard for a chicken yard.

Mr. Lord: I had a theory once that chickens would eat the curculio, and I fenced them into my plum orchard, but I could never induce one of those chickens to eat a curculio. In that part of the orchard where those chickens were was the only place the curculio destroyed the plums. (Laughter).

Mr. Harris: I have about a dozen trees where the chickens have their runs, and from those trees I get the worst plums. I advised Mr. Lord once to put in pigs, and I came pretty near having heavy damages to pay.

Mr. Lord: Pigs will eat plum trees from the root up. They will effectually destroy a plum plantation all except the heart wood. They will eat all the outside off and even eat the roots.

Mr. Gibbs: I left out of my remarks something I intended to say, something that I consider of the utmost importance, perhaps the most important thing, and that is, in planting our orchards we ought to remember that some of our best plums are shy bearers unless pollenized by other trees, and I would want to see that every other tree was a good pollenizer. I would give that matter careful attention, and look to the necessity of so arranging the trees with that end in view.

MEADOW VALE HORTICULTURAL CLUB, ANNUAL REPORT.

A. W. KEAYS, SEC'Y, ELK RIVER.

The second annual meeting of the Meadow Vale Horticultural Club occurred on October 30th and was the best the society has held. The program consisted of splendid music and songs, addresses by the president and members of the executive board, reports on fruit and election of officers for the ensuing year. The secretary's report showed that the trial grounds contained 850 apple trees, including 44 varieties; 400 plums, 21 varieties; 43 cherries, 8 varieties; also a large number of grapes, currants, gooseberries, raspberries, and 41 varieties of strawberries, besides some of the latest novelties. Small seedling peach trees set last spring have made one in. in diameter of new wood the past summer.

Apple and cherry trees, set in the spring of 1896, have made a splendid growth and ripened their wood well. Among the apples that look promising for this section are Longfield, Hibernal, Wealthy, Charlamoff, and Martha and Virginia crabs. We expect to bring out some new and valuable seedlings in the near future. Nearly all the trees purchased from traveling agents have died. They were, probably, southern stock, although represented to be grown in this state.

The officers for the coming year are: President, Chas. A. Hill; secretary, A. W. Keays; treasurer, F. E. Ingbretson; executive board, Geo. Keasling, Hiram Bailey, Albert Heath, A. C. Bailey.

DOVER FARMERS' CLUB AND HORTICULTURAL SOCIETY.

A. K. BUSH, DOVER.

We are not, strictly speaking, a horticultural society, but to make our membership and attendance larger, our field of usefulness broader and our papers, discussions, etc., do the greatest good to largest numbers, we consider subjects of general interest to farmers, stock feeders, grain growers, as well as matters horticultural.

This is about our manner of conducting meetings: A member who excels in his specialty is invited to prepare a paper or talk on a subject chosen for consideration, which shall furnish material for a general discussion, the president calling on each member for his offering, "class meeting style." These gatherings, which are well attended, are conducted in a very informal manner, questions asked, suggestions made, experiences given, results compared, as made from different methods tested. These "club" meetings are very interesting and profitable, and should be found in every neighborhood.

Our officers are a president and secretary. No dues or other expense is made, being a "free for all" institution, and it is doing good work in its small way.

Pardon me for taking this opportunity to refer to another society of which I am a member, and believe to be almost "ideal" in many respects. It is conducted on very much the plan suggested and recommended by our worthy secretary. His thought has become in part, our "Literary-Social Improvement Club," which meets every other Wednesday during the winter months at the home of some member, at 10 o'clock a. m. As this particular society is "at home" in the country, the male members make a tour of inspection about the farm and its buildings after the teams are put in, comparing what they see with what they have. Many valuable lessons are learned and taught while making these tours.

When invited into the house by the host, general greetings and hearty handshakings take place, followed by a social, all 'round, neighborly visit. "Gossip," politics, etc., are not allowed. At noon a lunch is served by the hostess from lap tables which accommodate four persons. The food supplied is largely the product of the farm, garden and orchard. These lunches, spiced and relished with jokes and hearty laughter without a care, will cure the "blues" and are suggestive of that fabled "fountain of perpetual youth."

The president calls "to order" at 1 o'clock, when the program for the day is rendered as prepared by the committee. At roll call each member responds with short items or quotations from literature, history, news or other information, as the program suggests. Vocal and instrumental music follow. Then papers are read on practical subjects written by practical people, and these are always discussed (with the "dis" never left off) and all are expected to take part in the discussions. Our papers include such subjects as: "What Should be the Ideal Farm Life?" "Hygienic Cooking;" "Well Balanced Food Rations for Children"—also "for Grown People;" "How to Best Prepare Foods for Use;" "The Garden;" "The Orchard;"

"The Farm," etc. Each strives to make his paper or speech as much of a literary production as time, ability and past advantages will permit. Two or three hours are used with such work, when the committee on program for the next meeting reports. Then we adjourn with the assurance that our club is a *grand* success and the day well spent.

An exchange of magazines and books is another good feature, one subscription giving each the reading of several different publications. We are also in proper harmony of thought and purpose to do much valuable and needed work in the community, such as beautifying and caring for our country cemetery, planting fruit and ornamental trees, flowers, etc., about our homes, along the roads, on the school and church grounds, especially the planting of of fruit trees by the public highways for the boys and the stranger who may come our way. Nothing less than ideal farms, farm life and living is our object, and to help each other to test its possibilities and so elevate our profession and position in life that as "tillers of the soil" we may look *down* from our exalted position on at least a part of the world, and not everlastingly feel that *we* are the *worms* of the dust.

We also hope to hasten the time when the growing of fruits and flowers shall not be done for the "money there is in it" and that only, but that all may better understand the thought of their Creator who placed them in this world that they might be used as expressions of love and sympathy; and we should study and learn to place them where most needed, in homes where sickness and bereavement are known, in hospitals and jails, schools and churches, &c., &c., also, that willing hands, for the love of fruits and flowers, not money, may plant, cultivate and use these expressions of God's love, with the same thought they were given.

We hope to interest and help our schools in such work. Such a society as we have, should and can be formed in every neighborhood in Minnesota; they will be in demand by all up to date rural districts when their value is learned and possibilities tested; they will adapt themselves to the needs of each particular community and become self-supporting fixtures in society. Test these statements with a practical example in your home, inviting neighbors to join you.

HUBBARD COUNTY HORTICULTURAL CLUB—ANNUAL REPORT.

A. W. LATHAM, SECY.:—I herewith hand you the report of the Hubbard County Horticultural Club for the first quarter of 1898.

The club was organized January 22, 1898, by the election of the following officers: President, S. W. Usher; Vice-President, F. M. Shepard; Secretary, H. Hazlett; Treasurer, L. D. Frazier.

A constitution and by-laws were adopted as recommended by the state society. The membership of this club at this report is more than twenty-five, of whom twenty-five are members of the state society, and have received the state reports.

Meetings have been held every two weeks since the organization, but after May 1st will be held once a month.

Interest in the discussions has increased steadily from the first, and we have good prospects for a useful and prosperous society.

ENOS M. RICKER, Sec'y Pro Tem.

Park Rapids, Minn., March 31, 1898.

Calendar for April.

PROF S. B. GREEN, ST. ANTHONY PARK.

The most important thing at this time of the year is to have well in mind the plan of the work for the coming season. Orders for seeds and nursery stock should have been placed some time ago. If this has not been done, it should be done at once. Do not give your orders for nursery stock to tree peddlers, but if possible go to the nursery yourself. If you cannot do this, write to some good nurseryman, get prices and so order intelligently. Ordering through the average tree agent has always seemed to me illustrated by the Irish proverb of "buying a pig in a bag." In ordering, if you have not already a supply, be sure and put in an order for peonies of the pretty modern kinds, some of the irises and spirea Van Houtii. There are many other desirable ornamental plants, but these are especially interesting to all, perfectly hardy and once planted require very little further care, but repay well any little extra attention. When nursery stock is received, it is very important to care for it well. Much nursery stock is lost by careless handling after it has been received by the purchaser in good order. It is important to heel in. Heel in singly, not in bunches, and to do it carefully. If the ground is dry, pack the soil solid around the roots, and there will be no trouble. If the wood on trees is shriveled when received, bury tops and all for a few days until swelled up.

One of the first operations in the spring is to uncover the plants that were protected in the fall. Raspberry plants should receive our first attention. It is desirable not to uncover until the buds begin to show signs of growth, but it should be done sufficiently early so that they do not start in the ground. As a rule, it is best to uncover strawberry plants rather late in the season. If uncovered early, there is some danger from late frost, but this can be prevented if a good supply of straw is kept between the rows, and it is put on when severe frost threatens after the plants have flowered.

As soon as the raspberries are uncovered, it is time to apply preventatives for the anthracnose. If plants were seriously injured last year or the new canes are badly spotted, it should certainly be done. Probably the best treatment for this is to apply before the leaves start what is known as thick Bordeaux, which is made of five pounds sulphate of copper, five pounds lime and twenty-five gallons of water; then after the leaves are unfolded apply what is known as thin Bordeaux, which is made like the above except that fifty gallons of water are used.

It is very important to set out gooseberries, currants, blackberries and raspberries very early, for if left until late sprouts will probably have started and will get broken off in the process of transplanting. Better not plant out strawberries until they start a little. As a rule, early planting is better than late planting with all hardy plants, even with evergreens, about which an erroneous idea has gone abroad that June is the best time for planting them out.

If there are vacancies in the orchard and you feel somewhat discouraged, try the Hibernal, if you have never done so before. It is

wonderfully hardy and a wonderfully good apple, too, for cooking purposes. I have never known the top of this tree to kill. I have known it to die sometimes from winter-killing when worked on tender roots, but have never known the tops to be injured.

In planting, this spring, be sure and put out a few Loudon raspberries, for they are by far the most promising variety under cultivation. They are new, and the price is rather high, perhaps three or four times that of common varieties, but they are well worth trying. This variety seems to be adapted to a wide range of soil and climate and is reported on favorably from almost every experiment station in the northern states.

It is desirable to have a good vegetable garden; perhaps no other piece of land pays so well. Don't try to have a finicky little one, with small beds that must be cultivated by hand, but plant in long rows, give plenty of room and cultivate with a horse. Many farmers have an idea that it does not pay to have a garden, and when the laborious methods which are used in cultivating the average garden are considered I do not know as it does pay, but when properly cultivated with modern garden horse implements it is by far the most profitable piece of land on the farm.

If the ground warms up the latter part of the month, try a little sweet corn; if it gets frozen, you have not lost much, and if it escapes the frosts you will have corn very early. It is customary with the most progressive market gardeners to take chances of this sort.

Do not fail to have an asparagus bed. If you have not one now, order 100 plants, or if you do not know where to get them, or fear to risk it, get an ounce of seed, worth ten cents, and plant it. It is as easy to grow as any seed and costs very little. An ounce of seeds should give several hundred plants, which would be enough for yourself and several neighbors.

Comparatively few persons living in the country have any hotbeds or cold frames. These are very desirable in prolonging the season, and the care and management of them should be more generally known. Two hotbeds, sash, 4 x 4½ ft. in size, should add very much to the table dietary during the months of May and June, before the outdoor vegetables have begun to come in, and the plants that can be grown in them will be helpful in the garden during the whole season. The hotbeds and cold frames should be in constant use this month.

Plantations of asparagus and rhubarb may be made during this and the following month. Onion sets should be planted out as soon as the ground can be worked. They, like onion seed, cannot be got out too early. Sow hardy (smooth) peas, lettuce, celery, radishes, cabbage, cauliflower, turnips, onions and spinach, and plant early potatoes as soon as the land is fit to be worked. By the end of the month, wrinkled peas, salsify and parsnips may be sown. See that the tomatoes sown last month are transplanted into beds or boxes so as to have plenty of room. It does not pay to crowd them. Transplant cabbage plants for the early crop, putting them in deep enough to completely cover the stems.

In the latter part of the month, all the early planted crops may need cultivating and some of them thinning, though but little of this is generally necessary until May. Radishes, lettuce, spinach and onions from sets, sown in hotbeds in March, should be fit to eat or to market.

Haul out manure and plow the land for planting next month. Transplant onion plants of the foreign kinds from the hotbeds to open ground.

Secretary's Corner.

IS APPRECIATED.—"I am well pleased with the Horticulturist and look it over before other publications."
Worthington, Minn., March 15, 1898. CHAS. SAXON.

DO YOU LACK READING MATTER?—For one-half cent an ounce the secretary will send to the address of any member, from the accumulations of the office. Enclose postage stamps for any amount wanted.

THE LATEST NEWS OF THE SAN JOSE SCALE.—Would you like the latest information on this subject? Illustrated circulars concerning this insect can be had upon application to Dr. L. O. Howard, Entomologist, Department of Agriculture, Washington, D. C.

RETURN THE FEBRUARY SUPPLEMENT.—If you have not yet filled out and returned the red detached leaf sent out as a supplement in the last number, please do so at once—and don't forget to affix your name and post office. The interests of the society will be much conserved by having this information in the office, and no member should be left out in the final "round up."

A HEALTHY ZEAL.—One of our members, E. G. Bovee, of Carlton, writes, that he is giving 100 strawberry plants to each of his acquaintances who joins our society. With such an interest in our work, he ought soon to have enough members in his locality to organize a local society and get the great advantage of frequent exchange of local experiences and the resultant increase of intelligent interest in horticulture. Mr. Bovee is setting a good example.

WILL IT KILL THE SAN JOSE SCALE.—A correspondent of the Orange Judd Farmer affirms that a little parasite, which he denominates Aphelinus fuscipennis, has "overtaken the intruder, and today we laugh at the San Josè scale and its threats." He advises the orchardist to "cultivate thoroughly and keep his trees in as vigorous a condition as possible. This will give them powers of resistance against the San Josè scale and all other troubles." His advice is good, at any rate.

SUPT. W. W. BARRETT CALLS.—We had the pleasure lately of seeing at our office this gentleman, a younger brother of the late Sec'y J. O. Barrett, and like him he is interested in forestry work, being superintendent of that work in North Dakota. Mr. Barrett is evidently a versatile man, as he combines in his person also the offices of Supt. of Irrigation and State Fish Commissioner. That he is a veritable enthusiast in his field is instantly apparent. He brings both zeal and method to his work. At present he is specially engaged in arousing an interest on the part of the children of that state in forest tree culture, and is distributing tree seeds to every school child therein. He is beginning right for ultimate results.

SPECIMEN INSECTS WANTED.--Prof. O. Lugger, State Entomologist, will issue next fall a bulletin devoted to a subject of great interest to us, viz.: "Insects injurious to fruit trees in Minnesota." He requests that insects of all kinds be sent him at any time from now on during the spring and summer. They can be sent by mail directed to him at St. Anthony Park, not forgetting to write your own address on the contents of the package.

A VALUABLE PLUM BULLETIN.—Prof. E. S. Goff, horticulturist of the Wisconsin Experiment Station, has just issued a very full bulletin on the culture of native plums. In a very detailed way he covers all branches of the subject, including a list of the cultivated varieties. This bulletin should be in the hands of all our fruit growers and can be had free, it is understood, upon application to the director, Prof. W. A. Henry, Madison, Wis. It is bulletin No. 63.

HAVE YOU VOTED ON THE RECOUNT?—A circular letter was sent out late in February to those who were thought to have been present at the late society election, asking for a repetition of the ballot for president in order to verify the result, which had been called in question. Any members who have not yet voted on this recount, whether they have or not received a copy of the circular here referred to, are requested to write at once to the secretary informing him how they voted, this information to be confidential if requested. A full recount is very desirable. The result will be announced as soon as completed.

NOTES FROM THE FARMERS' INSTITUTE.—"The meeting at Madison was a success; horticulture had the platform for more than an hour —at one time—creating quite a "revival" interest in tree planting—as was expressed with a flood of quotations and experiences centering around shelter belts, evergreens and plum trees getting first position.

"I am very favorably impressed with the idea of using the plum tree for a snow break, as it succeeds well in almost every section of the northwest; then grow evergreens for windbreaks and protection under this shelter." A. K. BUSH.

Morton, Minn., March 4, 1898.

COMMENCEMENT AT THE AGRICULTURAL COLLEGE.—"Ye editor" had the pleasure of attending the closing exercises of a graduating class of twenty-three young men at the State Agricultural College, on March 25th, and it proved an occasion of so much inspiration, we are resolved not to miss another similar event. This institution enjoys a new departure this year in that the Young Ladies' Hall has been occupied for the first time. The frequent reference to this fact in the graduating exercises is good evidence of the favor with which this innovation is received. The school is doing a great work in training the head to assist the hand in the agriculture of our state, and the steady increase of attendance emphasizes its popularity.

PROF. GREEN EDITS OUR CALENDAR IN 1898.—Our readers will be interested to know that Prof. S. B. Green has consented to prepare this valuable part of our magazine for the current year. Mr. J. S.

Harris, with his usual fidelity, has given us his assistance in this department since the inception of our monthly and welcomes this opportunity to transfer it to worthy hands. Prof. Green is well known to you all as the Professor of Horticulture at our State College of Agriculture, and in charge of the experiments in horticulture being carried on by our State Experiment Station, which is conducted jointly with the college. His large experience as a teacher, practical experimenter and writer, gives him special fitness for this work, and his gratuitous aid in this field is fully appreciated.

THE GOVERNMENT STILL A SEED VENDER.—The receipt in this office from the Department of Agriculture of five packets of garden seeds, all of sorts in common cultivation, like Purple Top Strap Leaved turnips, French Breakfast radish, etc., is evidence conclusive that Uncle Sam is still running in opposition to the legitimate field of the regular seedsman. There would seem to be no reason why the department should not confine this distribution to varieties that on account of their newness should be planted generally for testing purposes, and a report of results made. But no report is expected from the trial of the seeds evidently, as no blank for this purpose is provided and no report requested. Our society at its last session passed strong resolutions condemning this practice, and, as directed, they were sent to our delegation in congress. Both senators and four of the seven congressmen acknowledge their receipt, though only one gave an intimation as to how he should act in the matter, and he does "not see how I can consistently oppose" it as "his constituents are unanimously in favor of its continuance," though he admits it is "objectionable" in that it "smacks of 'paternalism.'" Of the other five two make no comment. Brief quotations are made from letters received from the other three, as follows: "I agree with the sentiment expressed;" "the original intent of the law has since been perverted;" "I am inclined to think the distribution of seeds as now carried out is a radical departure from the original intent of the law." "There is no doubt good ground for complaint in the matter to which the resolutions refer." The law providing for this distribution was easily re-enacted, and now seeds go out this year the same as before.

The receipt of these five packets of seeds saves us twenty-five cents, and "knocks out" some respectable seedsman to that amount. Thanks, Uncle S.!

PROF. HANSON'S ACQUISITIONS IN NORTHERN EUROPE AND ASIA.—Prof. N. E. Hanson, well known to our people as the horticulturist of the South Dakota Experiment Station, has just returned from his long trip through Russia and northwestern Asia, and, according to a statement of the Agricultural Department, is now preparing his report of what he has secured for trial in this country. Those items in this report of special interest to horticulture are cited briefly as follows:

"The musk melons of Russian Turkestan, Bokhara, Khiva and Trans-Caucasia were deemed worthy of introduction. Many varieties run from twenty-five to

thirty-five pounds in weight. oval in shape, flesh snow white, melting and superior in quality to any American variety. Seed of a large number of varieties was saved from melons bought on the spot.

"A large quantity of pits of the choicest varieties of the Vladimir race of cherries of east Russia was obtained from carefully selected fruit. These bear fruit of large size and excellent quality, and endure forty degrees below zero Farenheit. These trees, however, are a distinct race of cherry and must be grown from seed or sprouts in the true Russian fashion, as they are short-lived and tender when grafted or budded on the common commercial mazzard and mahaleb stocks of the nurseries.

"One thousand plants, the entire obtainable stock, was secured of a new species of raspberries of semi-recumbent habits, only discovered by explorations in the mountains of northern China. The fruit is orange yellow in color, of large size and of peculiar but very pleasant flavor. The plant has proven hardy at St. Petersburg. This is a new departure in raspberries, and it is worthy of general trial.

"Scions of some new hybrids of hardiest variety of the small fruited Siberian crab with the hardiest Russian apples, originated by a Russian experimenter by artificial cross fertilization. These will be valuable for trial in our northwest, far north of the present limits of apple tree culture.

"The Russian method of absolutely preventing the root-killing of apple trees on hardy stocks, was carefully studied, and seeds obtained for trial. This method will, no doubt. prove a great boon to a large part of our northwestern prairie states, where root-killing is the main obstacle to successful apple culture.

"From Turkestan, west China and Trans-Caucasia, native varieties of apricot, plum, peach, cherry, apple, pear, quince, grape and other fruits, and a collection of vegetables were obtained.

"A collection of new ornamental trees, shrubs from Siberia, Turkstan and the Caucasus.

"Seeds of plants used in Russian forestry experiments to bind the moving sands of the deserts of southeast Russia and Turkestan.

"Small lots of a large number of new legumes, cereals, grasses, trees, fruits, shrubs and ornamental plants, etc., recently discovered by Russian scientific experiments."

Besides the above there are a large quantity of strictly agricultural products.

The experiments of Prof. Hanson, at the station under his charge, with this material, will be watched with profound interest especially by us of the northwest, who have most to hope from these explorations.

The Secretary of Agriculture refers to his journey as,

"A trip involving many thousands of miles of travel in eastern Russia, Trans-Caucasia, Russian Turkestan, Western China and Siberia. The immense distances traveled, the change of climates and food, and especially the overland journey in Asia, which was a very rough and adventurous one, tested the endurance of the man sent on this mission. The trip was a successful one, and many promising varieties were obtained. About three carloads of seed will be distributed to the state experiment stations and others. These seeds, it is expected, will be chiefly of value in the arid regions, the purpose of Professor Hanson's trip being to obtain such as were distinguished for resistance to drouth and heat."

PREVENTION AGAINST BORERS.—"The injuries of the apple-tree borer may be prevented by applying late in May or early in June and twice later at intervals of three weeks, a strong solution of soft soap to which has been added a little crude carbolic acid. It will be made more effective and permanent by the addition of a small amount of paris green and lime. A paint made of pure white lead and linseed oil has also been found to produce excellent results."

Andrew Peterson

LATE OF WACONIA, MINN.

(For biography see page 193.)

THE MINNESOTA

HORTICULTURIST.

VOL. 26. MAY, 1898. No. 5.

THE PHILOSOPHY OF TOP-WORKING AND INFLUENCE OF THE STOCK.

J. M. UNDERWOOD, LAKE CITY.

Top-grafting is the art of converting one variety of tree or plant into another, and in the consideration of the subject at this time I will only speak of it in regard to its application to top-working the apple and plum. One advantage to be derived from it is to bring a variety into early fruiting. If you have some new varieties of those new seedlings that have been mentioned here, and you want to bring them into bearing quickly to see what the value of the fruit is, you can do it by top-working; and if you should have a good many of one variety of apple or crab that you do not want so many of, you can change them to a more profitable kind by top-working.

The stock that you should use is preferably something that is a strong grower, free from blight and hardy. Although in sections of the country where they do not pay any attention to hardiness, any seedling is hardy, and it is only necessary to have the tree in good condition, here in Minnesota, as applied to our work, I think we ought to consider the matter of hardiness; and last winter, if you remember, it was brought out here that the Virginia crab was one of the best stocks for top-working that we have. I have no doubt it is a good stock, because it is a strong grower, and the lateral branches come out all along the body of the tree, and it makes a very well proportioned tree when properly top-worked. So far as my observation goes, I think Mr. Dartt's seedling crab would be better than the Virginia; I have not seen it in large trees except in the original tree, but as a young tree it is a very excellent growing tree.

I have noticed in nursery work that where the top of a tree is very vigorous and strong, that the root is also correspondingly vigorous and strong. This is a little variation from the topic, but it applies to the subject under consideration, because if a strong growing top will produce a strong growing root, as it does in the nursery, we may

say that a poor growing tree is quite apt to have a poor root. You might think it was all due to the root that the top was strong or weak, but I do not think that is the case; I have noticed in passing through the nursery we see one row of trees that are strong and vigorous, and in the next row we have a weak growing variety; so I think the top has a great deal to do with making a strong root. But I do think a strong growing tree can be top-worked with beneficial effect on the variety that is top-worked on it; so I would suggest it should be the best stock you could get.

The plan of top-working, in my judgment, should be that of making a thorough job of cutting the limbs off. In other words, I would graft every limb on the tree, excepting only such limbs as I wanted to take off the tree later. Ordinarily on a tree that is six, eight or ten inches in diameter, we graft two-thirds of the limbs. I would not try to graft them too low down, but in such a way as to make a well proportioned top, so that the second year you may take off all that is left, and you have a perfectly formed top of new growth of the new variety. If you had to pay five cents a graft and had a good many trees to change by top-working, you would have to pay a good deal. Grafters would make good wages at two and three cents a graft, and you had better pay that if you are anxious to have the work done and have it well done, than to put in a graft here and there. Of course, you can do it yourself and can figure what your own time is worth.

The process I think most of you understand; I do not think it is necessary to go into detail in regard to the process. It is usually done on large trees by sawing off limbs, splitting the limb and putting in two grafts and waxing them thoroughly. The greatest care should be taken to use good scions, and after inserting the graft to see that the bark of the graft comes in contact with that of the limb that you are grafting, so there will be a flow of sap through the graft. And then the most particular part is to wax it properly. A good wax is made of five pounds of rosin to one pound of wax and one of tallow or linseed oil; the best wax is made with linseed oil. The wax must be used warm, which can be done by keeping it in warm water and having a little grease on the hands. If you do that waxing well you will make every graft grow, and if you let a particle of air get into the graft you will have a failure. I ought to say, perhaps, that after they are grafted you should keep the new growth away from the graft for at least twelve to eighteen inches, the new growth that will start out from them through the season, but allow all the other growth around the tree to remain, unless there is something that interferes by weakening of the graft. The leaves that are left are necessary to furnish nourishment to the grafts that have not started. In two years you can have a perfect top and have your tree fruiting.

Mr. Burnap, (Iowa): In the paper yesterday it was advised against top-working large trees; they said the grafts would break off. What have you to say about that?

Pres. Underwood: I did not catch that at the time. I should object to that statement. I have done a great deal of top-working on

large trees, and I am sure it can be made a success if properly done.

Mr. Burnap: Then you would set no limit as to the size of the trees, provided they were healthy?

Pres. Underwood: I have grafted a good many trees, very large trees—this was in Illinois, and they were probably three feet in diameter. Provided we have a perfectly healthy tree to begin with, we can have just as good success with a large tree as with a small one. In regard to the influence of the stock on the graft, my impression is that it does influence it, we know it must influence it, because it is in that way we get our best fruit. I think the stock does affect the graft, and it almost seems as though there was a degree of hardiness imparted, and it is my impression that that is true. Some of my friends, Mr. Elliot and Mr. Lord, were with me this summer where we saw the Abundance plum and other named varieties of plums that have been growing and fruiting for twelve or thirteen years, and they seemed to be hardy. They were top-worked on the wild plum, and it would almost seem to me that there was a degree of hardiness imparted to that plum. It is simply my belief, something I can not prove; but there are other illustrations I could give from my own experience in regard to apples. I think there is a degree of hardiness, a degree of earliness in ripening that is imparted to the fruit or graft by grafting it on an early and healthy variety.

Mr. Burnap: I thought it was a recognized fact that you could assist the hardiness of the graft by grafting on a hardy stock.

Mr. Penning: Do you think it is a good plan to wrap the grafts after they are waxed? I generally take a paper and wrap it around the wax, pressing it tightly together so as to shut off from the graft all the sun and air and everything.

Pres. Underwood: That would do no harm, although it is not necessary. If you are an expert waxer and the wax is of the proper consistency, waxing is all that is necessary. If you make it and put it on as I described and nothing interferes with it, it will stay there. The paper might prevent something from taking that wax off. The only thing the paper or the wax does is to make the graft air tight. The wax if properly made and put on will close the surface and exclude the air, and that will answer perfectly. My first lessons were taken in Illinois and Michigan, where we did a great deal of top-working. I think I have collected as high as $3,000 or $4,000 for top-working, and while people going around the country doing that kind of work are being considered by some as doing an illegitimate business, I have a great deal of respect for it where it is properly done. It is not necessary to pay ten cents a graft, but there is a right amount to pay for it, and if you get a grafter whose work is well done it is worth more to you than if it is poorly done when you do it yourself.

Mr. Crane: You say three or four cents is not too much to pay for each graft; do you mean where they live?

Pres. Underwood: Yes, sir; that is where they live. They usually put in two grafts and charge them up to you. That is the price paid if you employ a grafter; but you can do it yourself.

Mr. Spickerman: In small trees that are three or four inches in diameter, how close to the body do you saw off the limbs?

Pres. Underwood: If you take a well formed tree three or four inches in diameter, it would have branches running out three or four feet and then divide. I would take all of it off to just below where the two limbs branch. The idea is to have a nicely formed top. If you have a good eye, you want to use it to know just what shape you want the tree.

Prof. Pendergast: How large a limb would you saw off?

Pres. Underwood: In this state you could not get anything too large. You can readily heal over a limb two inches in diameter and from that down to a whip—as readily as you can an ordinary limb.

Mr. Spickerman: I suppose the idea of sawing off close to the tree is that when that graft has once become united to the tree it is not so liable to break off as if it were a foot or more from the tree.

Pres. Underwood: I am going to plant next year about 200 Dartt crabs; I may make a mistake, but I have a great deal of respect for the originator and, I was going to say, more respect for the tree. (Laughter). I am going to plant two hundred and let them grow and graft every limb. May be the Hibernal would be better stock, perhaps the Virginia would be better, but I am going to try the Dartt anyway.

Mr. Dartt: Just you try it. (Laughter).

Mr. Kimball: I think there is a question of congeniality concerned between the scion and the stock. Much of the early grafting was done on Transcendents. Some did not produce any apples, and some produced apples profusely. In some way the stock and scion were not congenial. That is a point that this society should explore very fully. Mr. Philips uses the Virginia, and he has found it to fruit freely, but the question of the blight in the Virginia is a very serious one. Up to two or three years ago Mr. Philips denied that there was any blight. Mr. Cutler discarded the Virginia and uses the Shields instead for stock. I am interested in the Hibernal for stock for two or three reasons. As I have not been able to ascertain or learn of any varieties it has been placed upon, it may not be congenial for fruiting, but while it may not be congenial to all sorts it seems at the present time to be so. One trouble with the ordinary farmer in grafting the Virginia is the rampant growth of suckers made about the scion, and if they are not very closely watched they will kill the scion, and in that way the work will all be destroyed; while the Hibernal does not make as rampant a growth, and the Hibernal has fewer limbs to make the top.

Mr. Beckley: Where two scions have been put in and both grow, should one of them be removed after they have grown to a certain extent?

The President: If the limb was the size of this mallet (indicating), I would split it across there and put it in two grafts, and I would leave both of them to grow the first year and take one out the second year. The two scions will help to heal over that cut surface. I have even put in as many as four in a large limb, and when the surface was healed over I would cut out the extra ones, but I would not do it until this surface was healed over

Mr. Beckley: That is the way I have been doing, but instead of splitting them I have frequently inserted them under the bark, just took one half of the scion and stuck it under the bark.

Mr. C. L. Smith: I do not understand Mr. Kimball as to where he has obtained his authority in regard to the Virginia. I have been to a good many farms and nurseries in Minnesota, Wisconsin and northern Iowa, and they are almost unanimous in favor of the Virginia as a stock to work on. He speaks about the gentleman from Illinois who discarded the Virginia in favor of the Shields. I got that same information, and I wanted to test its value, and I got one hundred of those Shields crabs, and they blighted a good deal worse than the Transcendent ever did. It is the exception to find blight on the Virginia, and there are hundreds of trees in the state fifteen to twenty years old. It is fifteen years since I came to the city, and I have been on the market every year, and I have not yet seen the market where the Virginia crab would not sell from 25 to 100 per cent. more than the standard apples; and so throughout the state the Virginia crab sells at a higher price in proportion than any of the winter apples. Three years ago I planted five of what I considered the hardiest I could get, including the Hibernal, the Duchess and the Virginia; I planted them out under rather unfavorable conditions, and I was away from home the following year all during the fall, and the ground was not properly cultivated, and every one of the Virginias is all right, while anywhere up to eighty per cent. of the other varieties are dead. That is the general experience in this country. I took up some of the Virginias and had them at the fair. The Virginia makes its own root. It is true, as he says, that if you cut off those branches the Virginia will start to grow up, and that is something in favor of it. If you cut off the top it will throw out more suckers; at the same time it will furnish more sap and vigor to push the graft along.

Mr. Kimball: I speak of my own knowledge when I speak of the Virginia blighting. Mr. Philips has acknowledged to me that the Virginia blighted with him. Mr. Belknap tells about the Virginia blighting in his locality, and I have met a good many more who say the same thing. That is not a myth.

Mr. Harris: Mr. President, I have not had my say. During the Mexican war I spent a year as a grafter of apple trees. I did not graft as large limbs as our president said he did; I think it is better to have a tree that is not over six inches in diameter at the most and the place to insert the graft is where you can make the best and cleanest job. There was a question brought up about the stock making it more hardy. I believe the tender stock has an influence on the graft. If I was at home, I believe I could prove it to your satisfaction. Another thing, speaking about having trees grafted by those traveling grafters; these fellows that come around doing that kind of work put in just as many grafts as they can find limbs, and they charge ten cents apiece for them if they live. I know a man who paid over one hundred dollars for grafting a little orchard. Then half the time we do not know what kind of an apple we are getting. A good many of those winter apples have turned out to

be Red Astrachan, and I do not think it is a good plan to let those fellows put in anything they please.

Mr. Hawkins: Speaking of the Virginia crab, I think the conditions surrounding the tree have a great deal to do with it. In my county the Virginia is subject to tree blight, and the Hibernal is exempt, on the same ground. In regard to this grafting, I never started until I was over sixty years old, and I have been able to make almost every graft grow. It is only necessary to make them air tight. I have a little granddaughter that can make whip grafts and make them grow every time.

OUR NATIVE FLOWERS WORTHY OF CULTIVATION.

MISS SARA M. MANNING, LAKE CITY.

Possibly the experience of an amateur in transplanting some of the native ferns and flowers from the meadows, woods and bluffs, may be of interest to others who enjoy removing bits of woodland beauty to their homes.

For this purpose the first requirement was a place where they would live and thrive, which was provided in a simple way. For one bed, a large shady corner, formed by two parts of the house, was filled in about a foot deep with rich mould from the woods, just the soil in which the plants grow naturally; and many came up of themselves. This bed was designed for plants from deep woods and northern bluffsides. Another long bed prepared in well fertilized garden soil was for those species which love the sunshine.

Then, each excursion to the woods resulted in the capture of rare trophies borne homeward in triumph. Sometimes all the available space in the carriage was filled with mossy rocks, from some cool ravine, which were made into mimic ledges, where dainty little ferns flourished; tiny Pilea seemed as much at home as on its native cliffs and Walking-Leaf took graceful steps, rooting at each point of rest, thus forming another minute plant.

Maidenhair, taken up with large balls of earth about the roots, grew luxuriently without discovering that it had been placed in less congenial surroundings, and Cystopteris tangled its long fronds with everything near. Woodsia, with deeply cut fronds, grew in masses, while the Sensitive Fern came up singly. Polypody, found on rocks at the summit of the bluffs, made evergreen mats. Another species which is extremely pleasing, though not common in our state, is Christmas Fern, which also has fronds of bright evergreen. Of taller species which formed a beautiful background for more delicate plants were Shield Fern of the marshes, strong growing Ostrich Fern and the two flowering ferns, also the Brake and elegant Lady Fern.

In this bed were also placed many of the plants which have these ferns for neighbors in the woods or on the bluffs: as starry Wood Anemone; pure white Bloodroot; lavender-tinted Hepatica, both the acute and round leaved species; Wild Ginger, more noticeable for its two large leaves than for the one dark flower hidden beneath them; False Solomon's Seal, with shining leaves and feathery

racemes; Mitrewort, which sends up many slender two-leaved spikes from a cluster of pointed leaves; Wild Sarsaparilla, which spreads a large compound leaf over the green umbles; Bellwort, with drooping flowers of pale yellow; and Rue Anemone, with a wealth of bright blossoms.

Jack-in-the-Pulpit grew larger than by the streams, and a Pitcher Plant added now and then another pitcher to the large cluster but refused to blossom. The different species of Pyrota made nice plants with their glossy evergreen leaves and spikes of nodding white flowers, as did also the Adder's Tongue, which has mottled leaves and small yellow lilies. Then there were Meadow Rue, Baneberries, Rock Cress, Wild Geranium, Senecio, Sweet Cicely, Zizia and many other.

Only two Lady's Slippers were tried, the common yellow one and the beautiful white and crimson Moccasin Flower. Among other orchids were Habenaria Hookeri, which has broad lily-like leaves and scapes of greenish flowers, and Goodyera pubescens, with crowded blossoms and leaves veined with white. All these orchids were very interesting, as members of their family are always found to be upon closer acquaintance.

In rich garden soil the sweet White Violets, found on the northern bluffsides, spread rapidly and blossomed profusely for several weeks in the spring and early summer, sometimes repeating the process in October. The golden Yellow Violets grew equally well and also different species of Blue Violets, though none of these increased so rapidly as the white ones.

In the garden bed, Greek Valerian grew much more luxuriently than in the woods, the loose panicles of Blue Bells mingled with the fern-like foliage making most graceful bouquets—and one of the pleasures to be found in cultivating the wild flowers is the many charming bouquets which they furnish.

Wild Columbine, as all know, spreads wonderfully in almost any soil, and, though so common, one does not tire of its crimson and gold. Alum Root, with marble leaves and tall spikes of odd-shaped flowers and Spiderwort in varying shades of blue and purple, are also easily cultivated. Wake Robin (Trillium grandiflorum), found singly in its native state, has a tendency to form clumps in cultivation. One of the surprises of the summer was the finding in a deep ravine many double flowers of this species, having thirty or more petals—monstrosities, doubtless, but very beautiful notwithstanding.

Cardinal Flower, which we have always associated with very wet places, will grow in rich soil which is kept moist, as will also other species of Lobelia. Golden Corydalis, which is a biennal, is a pretty plant with pale, finely-cut foliage and bright clustered flowers. It is closely related to the delicate white Dicentra, which requires much richer soil; its little pink-tipped hearts are among the flowers of early spring.

Other plants which were tried, with varying degrees of success, were Wild Phlox, Flowering Spurge, Red Lily, Solomon's Seal, Vicia, Lathyrus, Polygala, Galium, etc. Plants of rather sandy soil were

Wild Lupine, Azure Larkspur, Starry Campion, Partridge Pea, Prairie Clover, Butterfly Weed and Three-Flowered Avena, known as Apache's Plume because of its waving fruit.

In some out of the way place, where the powers that be will not say that they are too common and coarse to have around, one may find much of interest in a collection of compositae, as, Thoroughworts, Cone Flowers, Sunflowers, Blazing Stars, Coreopsis, Boltonia, Asters and Golden Rods.

Though other species might be named, the list is doubtless long enough to prove that even an amateur, without much knowledge of matters horticultural, may spend many pleasant hours experimenting with our native plants.

Before leaving the subject, honesty requires the writer to admit that there were many failures, owing to the perversity of certain rebellious species which refused to live anywhere in her vicinity, and what caused perhaps a greater disappointment was the fact that frequently in the spring some little favorites were found to be missing. This need not be discouraging, for there is an added enjoyment in seeking them again in their native haunts, of seeing the endless variety of lovely kindred among which they live, and then the beautiful setting of grand hills or stately trees.

The beds at home are an unceasing delight from the time the tender green leaves begin to peep through the dark soil in the springtime until the frost comes and lays all low. One becomes doubly familiar with plants in this way, and as we care for and learn to love these beautiful creations, so they in turn help to cheer us when the days are dreary.

"Your voiceless lips, O Flowers, are living preachers,
Each cup a pulpit, and each leaf a book,
Supplying to my fancy numerous teachers
From loveliest nook.

"Floral Apostles! that in dewy splendor
'Weep without woe, and blush without a crime,'
O may I deeply learn, and ne'er surrender,
Your love sublime."

Mr. C. L. Smith: The fact that we overlook the little things within our reach that do not cost anything and go to the nursery and florist's catalogues for the same thing and pay a big price therefor, is exemplified in this paper, and it has brought to mind a little experience I had here last summer, and I believe there are many of you who could take advantage of it as you may have similar situations. A friend of mine had purchased a place here in the city. There was a porch on the southeast corner; then a large bay window of a neighbor's house came up so close on the west that it shaded a good deal of the space around the porch on his lawn so that grass would not grow. I was up there last spring, and he asked me if there was any-

thing he could do so it would not be an eyesore, and I went to work to do the same thing I did on my own grounds; I simply took a team and went out in the woods and gathered every kind of fern I could find, planting the larger and coarsest kind near the wall and the finer near the front. It happened to be rainy weather, and they grew finely. Was it nice? You may judge from the fact that within a month from that time I had more than a dozen calls from different people asking me if I could not fix up something of the same kind. And that man says today that his friends, some of whom have spent ten to twenty dollars in green to fix up around their windows, all congratulated him on what he had, and wanted to know how he got it. There are many of those little things growing about in the woods that can be secured without cost that will make home more beautiful.

SPRAYING.

A DISCUSSION.

Mr. L. R. Bryant, (Illinois): Some of the "suckers" do not know a great deal more than you people do up here on that score. We may not know as much as we thought we did a few years ago. There has been a great deal of spraying done there and with varying results. With some of the spraying that was done with us near Princeton, several times we thought we had the best of results; then again we sprayed under what we thought similar circumstances and conditions, and we could not see any different results than we would have had without spraying. There is no question but what spraying will do some good if carried out carefully and systematically, but it has got to be done in a certain way. If you understand the cause and effect, you may have some good results. There has been a great deal of spraying done with us, and the results were sometimes very favorable, then again very unfavorable. We are going to continue spraying. We have been using considerable Bordeaux mixture. One great trouble this year has been scab. Take the Willow Twig, for instance. This year we had an orchard that bore very well; but the tree, leaves and fruit were covered with a sort of a scab. I think we have got to follow up spraying systematically year after year, and we have done enough to think we can accomplish something by following it up. We have got to do it even if we do not get a crop of apples. In spraying for fungus and for the codling moth we sometimes seem to have very good results, but some of our neighbors who do not spray have just as good a crop of fruit, so we must know just how to do it and when to do it in order to get the best results.

The President: How many in the room did any spraying on their apple trees and other fruit trees this past year? There are seven people who did spraying; I would like to hear from them as to the results they obtained.

Mr. Harris: The delegate from Wisconsin, Prof. Goff, is here, and he is familiar with spraying. I think we would all like to hear what he has to say on the subject.

Prof. E. S. Goff, (Wisconsin): I was one of those who raised my hand. We did spray a few times this year, but we sprayed mainly for the aphis on the plum and the pear tree slug on the pear and cherry trees. I have had some experience in spraying for apple scab and the codling moth. We have found that spraying for the apple scab is successful to a large degree; three-fourths of the damage caused by apple scab can be avoided by spraying, but it is necessary to do the work thoroughly. We began before the blossoms opened to make our first application. We used Bordeaux mixture and always added a little Paris green for the leaf roller. After the petals have fallen, we spray again, and then we put in Paris green for the codling moth. If the season is wet and warm, we spray frequently; if dry, we do not. We have had results that were varying, but saving from forty to eighty per cent. Mr. Hathaway is quite a large orchardist in Wisconsin, and he has been spraying his trees every year since 1890. He always sprays twice or three times, and sometimes four times, and he regards it as necessary in order to secure a good crop of apples.

Judge Moyer: I sprayed a very little on plum trees and gooseberry bushes. I sprayed them with Bordeaux mixture, and I got a very good crop.

Mr. Lyons: I never practiced spraying until last year. Apparently the fruit on those trees that were sprayed was better than on those that were not sprayed.

Mrs. Kennedy: We have an acquaintance who has a large orchard, and four or five years ago he told me his apples were so badly infested with the scab that they considered them of no value, but the last two years they commenced spraying, and he told me they had a perfect crop of apples, never had a finer crop. He used Bordeaux mixture.

Mrs. Stager: I sprayed my plums and apples; I gave them three applications, because we had quite a good deal of rain, and I had the nicest fruit and the largest quantity of plums and apples I ever had. The plums were rid of the curculio, and I never had better success.

Judge Moyer: Did you spray with Bordeaux mixture?

Mrs. Stager: Yes, sir.

Mr. Wedge: Prof. Goff, did you manage to control the aphis on the plum, and what spray did you use?

Prof. Goff: I considered my success only partial. I used kerosene emulsion, and it kills the aphis as soon as it touches it, but it is difficult work, as it infests the under side of the leaf, and it is a difficult matter to get at them, but the man would stand right by the side of the trunk of the tree and force the spray up, and by spending ten to fifteen minutes on a tree we succeeded very well. I thought at first it was a failure, but next day I found very few live ones; I watched them for a few days, and the live ones disappeared, and at the end of the week they had practically disappeared. Whether the

emulsion killed them and the parasites did the rest I do not know, but the aphidae disappeared. In one instance we had a very striking example of how the aphidae may interfere with the plum crop. We had two trees, more or less loaded two years ago; each tree bore a fine crop of fruit. The aphis attacked one badly, and then attacked the other, and although we cleaned it off by this spraying we found the plums from that tree were a full month later in maturing and not near so large, showing that the tree had been seriously damaged. If sprayed earlier we might have had better success.

Judge Moyer: Our plum trees were badly invested with aphidae, and although we did not get them all off we got a very good crop of plums. We had another experience in using a spray of Paris green on red willows that were affected with worms, and it killed them completely.

Mr. Burnap, (Iowa): I have been very much interested in this subject of spraying, and last year I had the honor to represent my state at the Illinois state meeting. They had at that meeting representatives from Kansas, Missouri, Michigan, southern Illinois, in fact, from all over this country where they have been practicing spraying, and when that subject came up before the meeting I expected to find out all about it, and I was ready with my note book to take home all the information I could glean from those people, who I supposed knew all about it. I found whole books could be written about what they did not know upon that subject; and I should judge that the subject of spraying is in just about the same condition as the question of the winter apple in Minnesota. You all believe you are going to have a winter apple, and you are all trying for one, and that is the condition of spraying; therefore, I suggest that in spraying we be somewhat cautious.

Mr. Van Houten, (Iowa): I want to say, like Mr. Burnap, that I do not know nearly as much on this subject as I thought I knew a few years ago. The same application under conditions appearing the same does not produce the results it used to produce a few years ago. The horticulturist has advanced a new theory in regard to the codling moth. It has been asserted that the egg was layed in the calyx of the apple; he asserts that is the exception, and hardly ever done that way. We usually begin to apply before the leaves are open. He contends the eggs are laid upon the leaves when the leaf is open, and it afterwards finds way into the apple. If that is true, we have made that much advance, because we have made the mistake of spraying too early. Many who have sprayed the longest have lost confidence in it, and the knowledge does not seem to be so definite as it was some years ago.

Mr. Wragg, (Iowa): We sprayed a good many years. The past year we did not have any codling moth at all up to August, but about August 15th the weather got very warm, and the crop seemed to hatch in Iowa, and the apples were badly affected. The early spraying did not hurt those fellows, but our fall apples all over Iowa were badly affected. How are you going to do anything for those hatches in the fall? We found spraying generally very effective. We spray with emulsion, not very strong; we go over the

rows and spray thousands of trees; we have to do it. We have tried Bordeaux mixture, and we have sprayed stocks that we wanted to bud, and we believe we got good results when the conditions were right, but we might spray the next season and not have the same conditions. There is something in the soil and the atmosphere that has something to do with this spraying question.

Prof. Goff: The truth is in regard to this codling moth, we have not fully understood its life history. Its history was studied in the east and was published, and we learn that the life history differs in nearly every state. The history correct for New York is not correct for Iowa and Minnesota. We need to study its history in the west in order to combat the codling moth successfully. In regard to the value of spraying, I think Prof. Bailey has hit the nail on the head. It is an insurance. It is necessary to spray with Bordeaux mixture before the disease appears, and if we spray before the disease appears it is always in the nature of insurance. If the conditions are favorable for disease then our spraying will be effective, in a measure at least. Possibly, it is true we do not know as much about it as we used to, but it should be regarded in the nature of an insurance, and like any other insurance may prove unnecessary.

Mr. Spickerman: I have a patch of Doolittle blackcaps that were affected with fungus and cane rust that nearly killed out the patch, and I thought I would try the experiment of spraying to renew the patch. I sprayed with Bordeaux mixture, and I have nearly renewed the patch. The stalks are not only free from cane rust, but they have had a good growth and bore last year. I have a neighbor who has sprayed all his fruit on what is known to Excelsior people as "Murray Hill." He has an orchard of about two hundred trees, and that orchard has been sprayed for five years. He has sprayed every year with London purple, and I do not think I make a false statement if I say that the apple crop has been from fifty to sixty per cent more than was ever taken from that orchard before. Last year they raised three hundred bushels, and this year two hundred and fifty, when one hundred bushels was as much as had been raised before they commenced spraying.

Mr. Burnap, (Iowa): What do they spray for?

Mr. Spickerman: They spray for scab and codling moth. The reason I speak of this spraying is because I have quite an orchard set out, and I would like to know whether London purple could not be used as well as anything else.

Mr. Lyman: Those people spray with London purple because they think it is beneficial in keeping off the blight.

Mr. Spickerman: In that orchard there are quite a number of Transcendent trees, which are quite subject to blight.

Mr. Lord: I was not aware that at Minnetonka you were troubled with the codling moth; if you have codling moth you will find that arsenites are of great value in spraying. In regard to what was said by Prof. Goff about the codling moth—I have seen the codling moth early in the season, and I have seen it late in the season just as the apple is ripening. We have had a good many, but a year ago we had altogether too many of them. In regard to the plum aphis—

that is becoming quite an enemy, and I have tried to control it with kerosene emulsion. We treat our plum stocks we wish to bud by taking a pail along and dipping it in. It looks as though we should kill every aphis, but we found we did not kill all of them, there were still a few left; but they gradually disappeared, and I think they disappeared from natural causes. I think the most practical thing to do is to watch our plum orchards carefully and pick off the first sign of plum aphis. By picking them off and throwing them on the ground they die, and I think we can easily control them in that way.

METHODS OF PROPAGATING APPLE TREES.

S. D. RICHARDSON, WINNEBAGO CITY.

I remember some fifty-six years ago, when I was a boy in Vermont, that my father's orchard was, with the exception of one tree younger than the rest, composed entirely of seedling trees. There were a few limbs scattered here and there through the orchard that had been grafted when the trees were small. All orchards in that part of the state were of the same character.

The theory prevailed at that time, and was very extensively put into practice, that one apple seed was as good as another, so the most of the orchards were planted with seed from the cider mill, and the result was cider apples. Some few persons thought differently and selected their seed from choice apples, and their orchards bore better fruit. A few years after we left the state people wanted better apples, and there was a general sawing off of limbs and grafting to something better, which seemed to give good results at first, but later there was a general failure, owing to the breaking off of the limbs. Persons wanting to graft often forget that all wood cut when grafting never grows together. The union comes through the new growth and the smaller the stock the more perfect the union.

It is not necessary for me to describe the different methods of splicing different varieties of fruit, for I am talking to horticulturists who are supposed to be familiar with the subject, but I will lay some specimens, both of grafts and of trees after several years' growth, on the secretary's table for your inspection later.

What is called whip-grafting, whether done in the root or on the limbs of young trees, leaves less cut wood than either cleft-grafting or budding and is to be preferred in as windy a country as the prairie section of Minnesota. Many of the stocks used, especially by nurserymen, are tender, and as budding is always done above the surface of the ground and usually remains there, the stock is liable to be injured by the cold weather. A root-graft made with a long cion and a short root, when grown into a tree, if properly handled, will have half or more of its roots from the cion, and the balance will be so deep in the ground that they will not be injured by the cold. A budded tree, as usually transplanted, does not often make roots above where it is budded.

Seven or eight years ago I set some cherry trees that came from

Atlantic, Iowa. They were of the regulation type—six feet high, with small tops. Those of you who have met with me in these meetings can easily understand that I did not want that style of a tree. I dug a trench two feet deep at one end and nothing at the other, put the tree into it, covered it up and straightened it up as best I could. Those trees have grown finely and are nice low-topped trees, with roots at the surface of the ground.

I moved a Louis Philippi cherry tree this fall that had been set three years, and it did not have any roots above where it was budded. It was a low-topped tree, to begin with, and was set upright some four or five inches deeper than it grew in the nursery.

Top-working, unless done when the tree is small, is a failure as far as my experience goes. Mr. Parks, of Pleasant Mounds, Blue Earth Co., Minn., who has top-worked more than any one else in this part of the state, says that he has given it up, for of the hundreds that he has grafted only one is left, and that is worked in the body. Budded trees can be grown successfully by taking trouble enough, but the root-grafted tree is the most successful with the same amount of labor.

I wish the members of this society could see some trees that we have growing at Winnebago City of what we supposed to be only half hardy varieties. After examining them thoroughly, I think they would be convinced that their chance for a long life was as good, if not better, than a long bodied tree of the same variety would have, even if top-worked on a crab.

TREATING TREES GNAWED BY MICE.–My experience in treating trees which have been gnawed is as follows: Take a ⅜-in. chisel, a chisel gouge of the same size, a light mallet and a sharp knife. Place the chisel in the sound bark just below the gnawed spot and across the grain of the wood. Drive it in about three-eights of an inch and again exactly opposite above the gnawed place. Now insert the gouge midway between the cuts and drive it down to the lower cut, turn the gouge and drive upward to the upper cut. With the knife cut a scion from the tree, cut square off at each end and a little longer than the space between cuts, and spring it into place so that the bark of the scion will meet the bark of the tree, which it is sure to do. My trees which had been planted two years were 10 to 12 ft. high and some of them gnawed entirely around. I put three to five scions in each tree. Always drive the chisel straight toward the heart of the tree. Get a barrow load of fresh manure from the cow stable and with a paddle, plaster the wound all around so as to cover the ends of the scions, and wrap with a piece of burlap and tie with woolen twine. Out of 48 trees treated only one died. The last time I saw the orchard, which was many years after the operation, every tree was in fine condition and all completely healed but greatly enlarged near the base. This work should be done in the spring about the time the sap starts. O. J. FARMER.

LOCATING, LAYING OUT AND PLANTING THE VINEYARD.

E. G. E. REEL, EXCELSIOR.

You all, no doubt, have heard the advice given by Mark Twain to the young man about to marry, "don't." Well, in respect to the hope of Klondyke-like returns in golden (minted) nuggets, my advice would be the same; but in the expectation of thrifty vines laden with clusters of fragrant grapes, the most delicious, the most healthful and the most satisfying of all fruits, I should say by all means, "*do.*"

The ideal location in my estimation is a piece of ground sloping gently to the southeast by south. A full south slope is next best but has not yielded any better results, as far as my observation and experience shows.

Assuming that we have selected the proper slope, the rows should be planted so that the shadows fall upon them when the sun is a little past the meridian, say about 2 P. M. The rows will be each one a little above the next and catch the early sunlight more evenly, the dew drying faster and the less powerful heat of the morning more gradually preparing them for the fierce heat of the summer sun, and the noonday sun will fall more nearly parallel to the rows, with the double advantage of warming the soil and at the same time leaving the rows to shade the young grapes from the heat, as they have proven with me to be very susceptible to sunburn at a certain stage of development.

Planting is a matter where "doctors differ," and as I have tried several methods I may presume to say I have had some experience. When the ground is not too steep, I would advise planting rows six feet apart, seven for the stronger growers like the Rogers No. 15 and Concord, and the vines from five feet apart for slow growers like Delaware to twelve feet for the stronger ones. Although I have not tried it regularly, I found that when by some accident a vine was missing and I let Delawares grow twelve to sixteen feet long and Concords even eighteen feet, I could see no difference in the yield per length of row from when the vines were at the regular distance. If, therefore, I were planting a new vineyard I would try a part at least that way, viz: Delawares sixteen feet and Concords twenty feet apart. I would be pleased to have some one's experience on that point.

In planting I make the invariable rule to plant each vine *myself.* In over 4,500 vines I have never allowed one to be planted by other than my own hands and feel repaid for the back-breaking task in knowing that the success or non-success of each one lay in my own care-taking. My method is as follows: Have the ground plowed to the greatest possible depth—which depth in my case I added to by turning the furrows down hill, dragging back—and harrowed to a satisfactory degree of tilth. I stake the exact position of each vine with one-half a lath or other convenient stake, making allowances for alleys. I like blocks of twenty vines in a row and eighteen rows about as well as any arrangement I have tried; however, if I were to plant rows six feet apart I would make every sixth row ten

feet apart in order to allow a team in for manuring, etc. Holes should be made wide enough to allow a fan-shaped arrangement of the roots and having a bottom sloping at an angle of forty-five degrees, and deep enough to have the roots straight. Never allow a hole to stand after being dug, but have a man dig each hole while you plant the preceding, and if the planting is properly done he will have ample time to come back and fill the planted hole. After arranging the roots and filling in carefully with moist, *rich* soil, tramp thoroughly with both feet when the hole is about two-thirds full and fill with loose soil. Vines that must be laid down for winter protection I plant with roots all to one end of stalk and all at forty-five degrees, only removing any bruised or lacerated roots and shortening to a reasonable length.

PLANTING AND CULTIVATING RED RASPBERRIES.

L. P. LORD, OWATONNA.

The ground upon which red raspberry plants are to be planted should be thoroughly manured, plowed and harrowed as the first and very essential step. The earth will then be very mellow and will sift around the roots of the plants and start them growing at once. The earth should also be moist; therefore, just after or during a rain is a good time to plant red raspberries. If the earth is very dry, a little water in each hill will greatly help the growth of plants. I remember that when I planted my fruit farm it rained part of the time, but we worked right through it. If the plants do not grow soon after setting them out, they are more likely to die than to live. If any quack grass or other disagreeable weed is found on the ground to be planted, dig it out as much as possible and carry it off before planting, for it is much harder to get it out from among the plants. Also, remove large stones which will interfere with cultivating if left between the rows.

The quickest and most economical way to dig the holes for plants is to mark the field with a three or four foot marker, according to the distance you wish to have between the plants, and with a plow make furrows about six inches deep at right angles to the marks and as far apart as you wish the rows to be. Plant with the marks, and at their intersection with the furrows, firming the earth around them and being careful not to break off the fine rootlets.

Plant one year old plants and have them as strong rooted as possible; by strong rooted, I mean that each stalk should have two or three large roots and many rootlets. Insist on getting such plants from the man you buy of, and you can well afford to pay more for them than for little *rootless sticks*, for such is what many dealers send out. Plant as quickly a possible after the plants are taken up from the ground. People sometimes think they must send far away to get good plants. This is a great mistake, for the length of time plants are out of the ground indicates somewhat their growing power, and the shorter the time, the greater is the ability of a plant to adapt itself to its new home.

If you wish to try a new variety, get twenty-five to one hundred plants and from them raise your own stock. You will then know what you are getting, and whether that variety will do well on your land.

Red raspberries may be either cultivated or mulched to advantage. I believe the most successful and profitable method is to cultivate the first year thoroughly and mulch thereafter. The young plants seem to need a thorough stirring of the soil. Mulching seems to conserve the moisture better and also prevents all growth of weeds, which sap the strength of the young plants. Besides, it is cheaper than cultivating. I have found flax straw best adapted for mulching, because it is more compact and holds together better, and it takes much less of flax straw than of wheat or oat straw. I have tried mulching around the plants and cultivating between the rows, but this method is not successful. Cultivating takes much time because the field must be cultivated often, and, in a wet season like our last one, it is almost impossible to keep the weeds down.

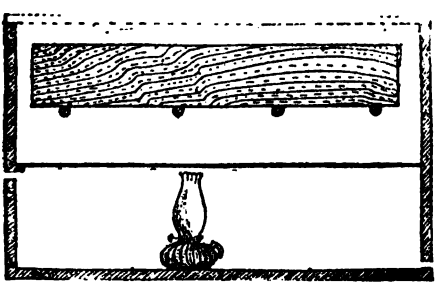
In cultivating, also, the long, tender stalks are liable to be injured by cultivator and horse, especially near the fruiting season.

The following is a good set of rules to go by in planting and cultivating red raspberries:

First—Manure, plow and harrow thoroughly.
Second—Clear of weeds.
Third—Mark and furrow.
Fourth—Plant fresh, rooty plants, and firm well.
Fifth—Cultivate first year and mulch thereafter.

STARTING PLANTS IN THE HOUSE.

Almost every one tries to start a few plants early in the spring in the house, but has no end of trouble carrying them from window to stove shelf at night to keep them from chilling. The illustration shows a way to avoid all this trouble, and at the same time to grow more and better plants. A box of any size desired, and about two feet in height, is arranged according to the design shown herewith. An opening is cut in one side at the bottom so that a hand lamp can be set in. This opening should have a hinged door. Above the lamp is stretched a piece of sheet iron, while some distance above this iron rods run from side to side across the box, for the support of smaller boxes of earth in which seeds are sown. A tight wooden cover can be made to shut down over the whole, to be opened each morning. A small opening is made in the top of the lamp chamber and another in the bottom, to admit air and let out any gas from the lamp. The sheet iron should fit so closely that fumes from the lamp may not get up to the plant boxes. A very small flame will keep everything very warm at night. Set the box before the sunniest kitchen window.—*O. J. Farmer.*



WINDOW PROPAGATING BENCH.

THE BEST METHOD OF PROPAGATING PLUMS.

JOHN NORDINE, LAKE CITY.

When I was invited by the secretary of our society to furnish a paper on this subject, I hesitated at first, thinking that my limited experience would prevent my handling this subject in as satisfactory a manner as could be done by some one of larger experience, but on reading the invitation more carefully, I noticed these words: "Let us come together and give our experience."

During the past sixteen years, in which I have been engaged as propagator for the Jewell Nursery Co., we have employed three different methods of propagating plums, viz: root-grafting, budding and crown-grafting; hence, my experience is limited to these three methods.

When employing the first method, root-grafting, we always did this immediately after we had completed our apple-grafting, which was usually about the first of March. We used stocks grown from seed gathered from our native plums. This seed was washed free from the pulp and laid in the shade for three or four days until it became dry enough to handle, when it was planted. At the close of the following season, we had a fine stand of nice, healthy seedlings, of fairly uniform caliber, the size being about that of an ordinary lead pencil. In the fall, we dug these roots, packing them in sand in our cellars. The scions were also cut in the fall, placed in the cellar, and packed in sawdust fresh from the mill. The method of grafting was what is ordinarily called "whip-grafting." The grafts were well wrapped at the point of the union with waxed paper and then packed in sand in boxes specially made for this purpose. These we kept in cold storage until the following spring, when the grafts were set out as soon as the ground was in proper condition. The weather was exceptionally favorable at that time, and we hoped to secure a fine stand of plums, but we were rudely awakened from this sweet dream. On examining the grafts later in the season, we found they had thrown out numerous sprouts from the roots, while the scions still appeared to be nearly dormant. At a great expenditure of time and labor, we removed all these sprouts, thereby encouraging about thirty-four per cent of the grafts to start. They lacked vigor, however, and grew very slowly, and the bodies being very slender they bent and whipped in all directions, and when three years old and ready to go on the market, they were an extremely crooked and unsatisfactory lot of trees.

This experience was rather discouraging, and we hardly knew what method to adopt for our next attempt in this line, but after considering the matter from all standpoints we finally concluded that our scions might have been cut too early. We therefore grafted our plums the next year in exactly the same manner, except that we cut scions in the spring instead of in the fall. This, however, was not much of an improvment over our first trial, as we only dug about forty-seven per cent of this planting.

Now, we were fully determined that our next attempt in propagating plums should be nothing short of success, so finding ourselves

evidently off the right track, we turned about and came in, as we thought, on the main line, in our next experiment. In the fall, when the time arrived for digging our seedlings, instead of packing them in the cellar, we prepared the ground and planted them where we expected to grow our plums, planting them in rows three and one-half feet apart and ten inches apart in the row. The following spring and early summer, we kept these seedlings thoroughly free from weeds by hoeing and cultivating, and by July 20th we had a very nice stand of seedlings, which we then budded, principally with Weaver, Desota, Forest Garden, Wolf, Hawkeye, Rollingstone and Cheney; but as the weather was very hot and dry when we did our budding, we did not get more than seventy per cent. to catch, and in the following spring we found many buds that the fall before appeared to be all right had died during the winter. This reduced the number of live trees from this budding to about fifty-seven per cent. These, however, started immediately and made a very good growth, some of the young trees reaching a height of four to five feet at the close of the first season, and when ready for market they were straight, well branched and fine looking trees; and we realized that budding plum trees was a great improvement over the old way of grafting. When digging these trees, however, we noticed that some of the varieties had made a very poor union, so poor, in fact, that in the process of tying them in bundles some of them broke in two at the point where they had been budded.

The demand for native plum trees was continually increasing, as our customers gradually learned that this was one of the most profitable fruits for our state, but the difficulties we had encountered in our propagation so far forced us to look about for some other and more successful way of growing these trees.

In our next trial we sowed the seed very thickly, and by so doing obtained a thrifty lot of rather slender seedlings. In the fall, we transplanted these in the same manner as we had done for budding, but instead of budding them, we grew them that summer, and in the following spring, as soon as the ground could be worked, we removed the soil from around the seedlings to the depth of about two inches. We had cut our scions in the spring, and we now grafted them on these roots just as low as we conveniently could, and after applying the wax turned the soil back again, thus covering the union and part of the scion with earth, leaving one or two buds above the surface—and it is really a delight to the grower to see how grafts set in this way will start. By this method we have few sprouts to fight, and by covering the scion (or nearly so) we have but little pruning to do, and above all we secure a perfect union, and, instead of the crooks found on a budded stock, we have a straight, clean, smooth and vigorous tree, well worth the labor that has been bestowed upon it.

In conclusion I would say, in propagating plums, either for private or commercial purposes, always remember three things: first, use none but native roots; second, cut your scions in the spring; and, third, graft on a stock that is already established in the ground.

Mr. Wedge: I do not want Mr. Nordine to give the budded plum too bad a reputation here, because I grow my own plums in that way. Our practice is to plant the pits in the spring and bud the shoots in August of the same year, and we have very good success in following that method. I find our budded trees are frequently six feet high, and some of them are seven feet high in one year from the time they are budded.

Mr. Nordine: Mr. Wedge says he sows his plum pits in the spring. I cannot understand how he can get them to germinate, sprout and grow so they will be big enough to bud in August. I have always found that it is necessary to plant our deciduous tree seeds in the fall. We necessarily have to have the winter freeze to operate on them so they will start nicely in the spring. We never let it go later than the 28th of July before we bud our plums. We never could grow seedlings large enough to make a good bud in the spring, therefore, we had to let them grow one year and winter them over, start them over again in the spring and grow them until about July 20th; we then had them about as thick as the finger. It takes time to heal that wound over, and you will find a piece of dead wood in there. You will find if you cut open the tree at that place, you will have a piece of dead wood. In speaking about the wound on the end of the scion, the scion we generally take is a little bit smaller than the root, and we take a very sharp knife and make a slanting cut, and it will be closed over in a few days.

Mr. Richardson: It is a fact that is well known to any one who has ever grafted, that the wood in the graft never unites. I never saw any that did. With a whip-graft you have got a little smaller tree, and while I believe in practicing whip-grafting, I have seen on Mr. Wedge's ground no more wood to cut off than on my whip-grafting. With the whip-graft, no matter how nicely it grows together, you can still find the point of union.

Mr. Wedge: In regard to getting seedlings large enough to bud the first year, I do not have any difficulty. This year we had the greatest lot of seedlings we ever had. We always bud in August, and I have even budded in September, but I did not have very good success then, but this year we had the finest lot of stocks to bud I have ever seen, and they were two and one-half to three feet high. I think it would be a good idea to sow them in the fall. We freeze them.

Mr. Jewett: Do you find it necessary to mulch them? I find I have very good success without mulching at all.

Mr. Wedge: Our soil is a clay soil, and it heaves very badly, and a good many pits would be on the surface in the spring. Nature always provides a mulch for her seeds; I have sown pits without mulching, but have had better success when mulched.

Mr. Wragg, (Iowa): We treat seedlings the same as Mr. Wedge does, plant the seed in the spring and bud them the next season, and we get one hundred per cent every time. In June we cut our bud stocks, we insert those terminal buds in the stock, then cut them right off.

Mr. C. L. Smith: The point Mr. Wedge makes about sowing his

seed in the spring is a good one. I am quite sure that if plum seed is sown in the spring, you get a better stand than if sown in the fall. I tried it in sowing box elder in the spring, and I can raise a great deal more box elder by sowing in the spring than by sowing in the fall. Where the plum seed is frozen and then sown in the spring you get a better growth than if sown in the fall.

Mr. Nordine: In regard to sowing the pit in the spring. We also have had experience in that line, and one thing we met with very often switched us off entirely from spring sowing and put us on to fall sowing. Having your pits stratified in the sand, they will begin in the spring time to open up and germinate, and many times we had those heavy spring rains that made it impossible to get our seeds in the ground, and those in the sand would be progressing right along and growing, and many times the sprouts would be half an inch long, and many of them would be broken off; and they would be exposed to the open air. We never had as fine a stand of seedlings as we did from fall sowing.

Mr. Penning: I want to give my experience in this matter. I gather the plum seeds in the fall, as soon as we eat the plums, and I put them in a nail keg, throw in some seeds and then throw in a handful or two of soil, and in that way I keep on putting in seeds until I have all I want; and then I set them outdoors until about the beginning of March, when I take the keg and put it in the cellar till I get ready to plant. I watch my seeds, and when they get ready to sprout I plant them, and I always get good seedlings.

Mr. Richardson: The Jewell Nursery Company has a sandy soil. I have always practiced fall planting, and some years I have lost my seeds because in the spring the ground was dry and the soil blew away to my neighbor's farm, when the seeds would become exposed, and the gophers would come and shuck them. If I had planted them at that time I would have been all right, but when you lose an inch or two of soil, as we do, fall planting bothers. Still I have always practiced it and tried to get my seeds in a place where the soil would not blow away.

SUB-IRRIGATING FLOWER BEDS.

The experiments that have been tried in introducing water freely below the beds of growing plants have proved conclusively the value of this kind of watering. The cross section given herewith shows how one may readily try this experiment for himself this spring. Select the spot where a small bed is to be devoted to foliage or other plants, and sink an empty keg in the center just below the position of the coming roots. Fit an old piece of tin pipe, as suggested in the sketch, and your "irrigating plant" is ready for business! Not only can water be thus freely applied, but liquid manure also. The keg, it should be said, should not be one that will "hold water."

CULTIVATION VS. MULCHING IN THE ORCHARD.

DEWAIN COOK, WINDOM.

A newly set orchard should always be cultivated and never mulched, as a heavy mulch around a tree recently set is liable to kill it, especially on our cold, black prairie soil.

It is a fact that the more the orchard is cultivated in early summer, the more air and warmth gets to the roots of the tree, producing conditions that are favorable to a rapid growth. Mulching produces the opposite conditions and should never be used around small trees, unless it is done in the fall or early winter to prevent root killing, and even then it should be plowed under in the spring or hauled away. Mulching should not take the place of cultivation in the apple orchard until after the trees have been set seven or eight years, or until it gets to bearing nicely; then perhaps it may be advisable to do some mulching in connection with cultivation, mulching in the rows and cultivating between the rows.

I have had no experience caring for an old orchard and will not attempt to advise those that have, but from what I have observed, I am of the opinion that mulching, if properly done, is preferable to cultivation. Care should be taken not to mulch a tree so heavily that when it is in bloom the roots are encased in frozen earth, as such a condition will cause a failure of the crop. I know this to be so of the plum, but as the apple blooms considerable later such conditions are less liable to occur.

Hay or straw makes a poor mulch; in fact, I would not use it. Barnyard litter is best. The benefits to be derived from mulching come largely from the fertilizing material it contains.

Mr. Van Houten, (Iowa): Our best horticulturists have come to the conclusion that shallow cultivation is the best thing for orchards. Running through with a disc both ways and cultivating the ground thoroughly.

Mr. Burnap, (Iowa): I want you to distinctly understand that that will not do in northern Iowa. It is all right to cultivate up to July and then stop, but it will not do to keep the cultivator running right along in northern Iowa.

Mr. Dartt: I want to say that it *will* do in Minnesota. (laughter).

Mr. Bryant, (Illinois): I think it would depend much on the season. If it is moist and good growing weather, it is not necessary, but in a dry spell you want to tide it over so as not to check the growth.

Mr. Harris: My idea is that the cultivation should correspond to the season. If your trees have stopped growing in July, and there comes a spell of warm weather in the fall, and you cultivate up to September, and then you get some good heavy rains, as we had them in 1884, it starts a new growth in

October, and you are going to get left. Our nursery trees that are cultivated as long as there is any growth, are better than the others. Sometimes those trees in which you have stopped cultivation early will ripen up, and then the buds will swell again. That is where we get the most danger—and then cold weather coming right on.

Mr. Wragg, (Iowa): We use surface cultivation. We have found the best thing to use is Clark's cutaway harrow; we use that in our orchards both ways, and if the season turns out very dry we keep it up during the month of July. We sow buckwheat sometimes late enough so it does not ripen its seed. We run the harrow through every week.

Mr. Spickerman: Do you do that in orchards that are grown up to sod?

Mr. Wragg, (Iowa): Yes, sir; we have used this method to cut up the sod.

Mr. Harris: Down in Arkansas I saw two orchards where the cultivator had been kept running up to the first of October; the fruit was all large and perfect, very fine. They had six or eight weeks without rain, and the fruit that came from those orchards was better than any I ever saw. In orchards that had had no cultivation for several weeks, a great deal of the fruit was smaller.

Mr. Wragg, (Iowa): I was down over the line of the Pittsburg & Gulf railroad. There were orchards ten miles long, and in orchards where they had the same mode of cultivating the trees were one-third larger and maturing better, and their orchards had been growing one year longer than those orchards in Arkansas.

Mr. Burnap, (Iowa): I do not want to be understood as opposing the cultivation Mr. Van Houten mentions, and this man in talking about in Arkansas, but I think we in the north must decide when that cultivation must stop. There is a time when we must stop it, and I am satisfied that in northeastern Iowa usually that season is early in July, and then when we do stop, to sow a little bit of buckwheat is the best thing we can do.

The President: Our greatest injury in Minnesota comes from lack of moisture. We cannot get any damage done or hurt the trees if we keep up the cultivation so as to prevent the evaporation of moisture.

Mr. Wragg, (Iowa): I should be afraid of it.

Mr. Dartt: Put on a dust blanket.

Mr. Wragg, (Iowa): If we should put on a dust blanket it would blow away. I would rather have the buckwheat to conserve the moisture; it is better than anything else.

The President: You sow that in July?

Mr. Wragg, (Iowa): Yes, in July.

Mr. Dartt: Well, we have the advantage of you fellows; our soil does not blow away. (Laughter).

Mr. Bush: Is there not a happy medium between those two extremes? I cultivate my orchard freely until the first of July, then mulch with barnyard litter and allow that to remain, and in that way get good results.

Mr. Harris: I would keep the litter out.

BEST THREE EVERGREENS FOR SHELTER.

CHAS. HAWKINSON, MINNEAPOLIS.

During the twenty-three years' experience as nurseryman near Minneapolis, I have grown and planted a great many evergreens, yet it is just as hard for me to select the best three evergreens for shelter as it would be for me to pick out the best three members of this society. There seems to be no variety of evergreen that will stand our western blizzards without being somewhat protected. I consider the three following varieties best for shelter: Norway Spruce, Red Cedar and Norway Pine, or what is usually called Red Pine. For a fast growing evergreen, I would plant Scotch Pine, but when it reaches the age of 15 to 20 years it begins to grow scraggy; therefore, I have not placed it on my list. White Spruce is another evergreen that has generally given good satisfaction, but I consider the three first named varieties the best.

Mr. T. T. Smith: What does the gentleman mean by the red pine?

Mr. C. L. Smith: One of them has very long needles, and the other one has fine needles, more scattering. He means the one with the heavy leaves; you can scarcely see through it.

Mr. Elliot: It is the native Norway pine growing in the northern part of the state.

Mr. C. L. Smith: In handling this Norway pine, what success have you had in transplanting?

Mr. Hawkinson: They did not transplant as good as the Scotch pine, but they are a good tree.

Mr. Dartt: I have had experience with the red pine, this long-leaved, heavy pine. The tree station set out a good many, and a good many of them failed. I hardly think this red pine is worthy of planting in the dryest sections of the state. It may do where moisture is abundant. In regard to the red cedar, I think you will find that the majority of the red cedar are tender. I bought some at two or three different times, and I think four-fifths of those I bought proved worthless, and still I bought those that were said to have been grown from northern seed.

Mr. Hawkinson: This is only for shelter I am speaking about.

The President: We are only speaking about the best three for shelter. I would put in the Scotch pine. What we want is that you name the three best varieties for shelter.

Mr. Dartt: Yes, I would take the Scotch pine, the Norway spruce, and I am inclined to favor the white spruce next. That makes three, I believe.

Mr. Harris: Mr. President, it is my humble opinion that of all the evergreens that can be grown in the northwest the white spruce stands at the head. It makes a finer growth than any other of our native evergreens, it is easy to transplant, and it makes a dense handsome tree if you give it a chance. The Norway spruce makes a more rapid growth, but when we get a hot day that tree loses its foliage to a great extent. Therefore, I place the white spruce at the head and front for windbreaks, shelter belts and for a large proportion of groves also. Next I would place the white pine (Pinus strobus); it is one of our finest trees, and in the end when it has come to maturity it is the most profitable tree we have in Minnesota. It seems to be easy to transplant, and after it gets to a little size, (it is easy to manage) we do not have to plant it close to get a good windbreak; we soon get an excellent windbreak. If you plant them in rows, you want them about thirty feet apart. Next to the white pine I would place the Scotch pine. It stands the high wind well. These three trees, in my opinion, are much better than the trees named. This red cedar will grow in very poor places, and if you once get it established it will do well; however, it will take a great while before it amounts to much as a windbreak or as a shelter. The red cedar under such conditions is very slow growing, yet if it is planted on rich land, such as we should plant a great many of our trees in, it is not as hardy as we supposed it to be. A year, yes, years ago, during one of those winters that did so much damage, when the extreme cold reached down through portions of Illinois, Indiana and Ohio, in territory where red cedar had been planted, it destroyed a large portion of them.

Mr. C. L. Smith: You know it has been a hobby with me for a great many years that our Minnesota evergreens were better than any others. Mr. Hawkinson should have said *northern* red cedar. We can always get seed and young trees cheap from the south and southwest, but red cedar grown from Minnesota seed and gathered in the woods of Minnesota is expensive, and with them as with a great many other things, the people would rather get more trees for less money, so they are not inclined to plant northern trees. There are hundreds of plantations made in Minnesota of red cedar, particularly where the red cedar grows so thriftily, and wherever those red cedars have been planted they have been entirely successful. I hold that the three best evergreens for shelter belts in Minnesota, the three that can be planted with the greatest certainty of having good, live, healthy trees twenty-five to thirty years after planting, are the Minnesota white spruce, not the white spruce from Illinois, Michigan or somewhere else, but the Minnesota white spruce, the red cedar, the Minnesota red cedar, and the white cedar grown in

Minnesota from Minnesota stock, those are the three best evergreens grown in Minnesota.

Mr. Harris: For my own use I would prefer the northern red cedar or the Scotch pine.

Mr. Bush: I wish to emphasize the statement made by Mr. Smith in regard to northern grown evergreens, but I think in recommending three evergreens we had better recommend them for certain localities in the state. We found in the discussion we had last year on the subject of evergreens some that succeeded splendidly in southern Minnesota that did not succeed in other portions of the state. There are more native white pine windbreaks that are successful than any other, but they are Minnesota seedlings. The cedar was recommended, but the cedar is a failure with us, because the stock is from southern seed. Wherever planted they are a total failure, but where we plant the red cedar gathered in the woods on the ridges, we find they make satisfactory growth; but the white pine and the Scotch pine we regard as our best evergreens for shelter belts, because they are so easily transplanted. They grow rapidly and turn the snow in a short time, and they have everything to recommend them as being the best evergreen for southern Minnesota. They may be a failure in other parts of the state, but in southern Minnesota they are a decided success.

Mr. Dartt: What other variety do you refer to?

Mr. Bush. The Scotch pine. I place the white pine first, because with us it belongs in that position. That is only for that location. In recommending this list last year I recommended it for southern Minnesota.

Mr. C. L. Smith: Is it not true, Mr. Bush, why you have so many white pine growing, that the white pine can be gathered the most easily, and is it not true that that is one reason why your white pine hedges are more frequent?

Mr. Bush: Yes, that is true. The seedlings from which those trees came came from those ridges. Where we have taken up those little seedlings and transplanted them, I have not found a single tree that has died from drouth in the extreme drouth we had.

Mr. Dartt: I think in our recommendations of trees we should recommend them as we get them, as we find them of worth in the market where they are to be planted, and if there are any conditions they should be put in with the recommendations. The white pine I believe requires a clear atmosphere and, perhaps, a more moist atmosphere than some of the others, so much so that it will not do well in a dry atmosphere. At Owatonna it is not nearly equal to the Scotch pine, and I think you will find that in the western part of the state the white pine does not stand as well as the Scotch pine. In regard to the red cedar, I believe it is something as it is with trees from apple seeds; some of them will be hardy, and some will be tender, at least that was the case with trees I bought that were grown from northern seed. I got them from Douglas; some of them proved hardy, and others, the nicest of them, proved a failure. So I think there is a little variation, and I have thought the variation extended to other seedlings, that some of them would be hardy and some of them tender.

Mr. Elliot: I think seeds and plants received from Douglas are not a criterion to go by. My experience with native red cedar has been that invariably it has proved itself hardy, but I do not consider it the best tree for windbreaks. I would agree with Mr. Bush and with Mr. Smith, and place the white spruce first. When I was in the nursery business I started in with Norway spruce; considered that was the best tree for hedges and ornamental planting, but, as Mr. Harris states, it is subject to sunscald. At that time I sent to northern Minnesota and got some spruce seedlings and planted them out, and they have shown no indication of sunscald. I can pick them out all over the city here. I would take the white spruce first, and next the white pine. The Norway pine I have had some experience with, but I do not consider it as good as the white pine. It is as hardy, but it does not transplant as readily as the white pine. The Scotch pine is a good tree, but it will not make the same growth as the white pine will, and it does not look as well. Take it on the open prairie where it is exposed—I think L. B. Hodges said the Scotch pine was preferable to any other evergreen on our prairies.

TRANSPLANTING EVERGREENS FROM THE FOREST.

WYMAN ELLIOT, MINNEAPOLIS.

In presenting this subject, it is well, first, to particularly understand the nature of the material about which we are writing. Dr. Lindley says, "An evergreen differs from a deciduous plant in this material circumstance, that it has no season of rest; its leaves remain alive and active during the winter, and, consequently, it is in a state of active growth. This does not mean that it is always lengthening itself in the form of new branches, for this happens periodically only in evergreens and is usually confined to the spring; but that its circulation, respiration, assimilation and production of roots are incessant, except when the ground is hard frozen. Such being the case, an evergreen when transplanted is liable to the same risks as deciduous plants in full leaf, with one essential difference. The leaves of evergreens are provided with a thick, hard epidermis, which is tender and readily permeable to aqueous exhalations only when quite young, and which becomes very firm and tough by the arrival of winter, whence the rigidity always observable in the foliage of evergreen trees and shrubs.

"The phenomenon which we call the fall of the leaf is going on the whole year. Those trees which lose the whole of their leaves at the approach of winter and are called deciduous begin, in fact, to cast their leaves within a few weeks after the commencement of their vernal growth, but the mass of their foliage is not rejected till late in the season. Those on the other hand which are named evergreens part with their leaves much more slowly, retaining them in health at the time when the leaves of other plants are perishing, and do not cast them till a new spring has commenced, when other trees are leafing or even later. The functions of the leaves on the evergreen are going on during the winter, although languidly;

they are attracting sap from the earth through their spongelets and are therefore in a state of slow but continual winter growth unless hard frozen.

"The sap or circulating fluid essential to nutrition of the two species of trees is very different; in the former it is thin and watery, and in the latter it is of a thick,resinous nature. On account of this property in the sap of the evergreen tree,if once dried it can never be revived into living action. This peculiar quality of the sap and the retention of the foliage all the year make it more difficult to transplant and handle evergreens than deciduous trees with success, but with proper precautions and care they can be transplanted successfully by any one who feels that a tree is a live organism and, as such, should be so treated."

The spring season has long since been decided by the most successful planters to be the best time for transplanting evergreens in this climate, and the ideal time is in cloudy weather, when the air is saturated with moisture, just as their buds begin to swell. At that period the tree in all its parts immediately starts vigorously into active growth and receives but little check when properly dug and transplanted.

Next to the selection of time for digging is the preservation of all the roots possible, and these to always be kept in moist condition. One of the evil practices in the transplanting of all classes of trees is the careless, slovenly manner in which the trees are too frequently taken up and handled, sufficient care not being exercised in this very important process.

Now, having formed some idea of the nature of the material of which we are treating, we will consider the evergreen seedlings as we find them scattered in the forest, growing under natural conditions with somewhat different surroundings from those produced under the watchful care of man in the nursery. In the forest the seed drops from the trees and is covered by the falling leaves and lies in a dormant state until the proper conditions are furnished by sunshine and rain for their germination; plant food is furnished by the decaying of the leaves, and the mother trees provide the necessary shade and protection. Here the embryo seed finds the moist, even conditions, in nature's way, for their germination and young growth. The forest tree seedlings have no nursing hand to care for them in their infancy and supply the needed requirements of growth at critical periods, except what is derived from the natural elements surrounding them. From the first it has been a struggle for existence, a survival of, not at all times the strongest, but of those that happen to have the proper elements within the reach of their tiny roots from which to draw sustenance. Now, when man attempts to remove these young organisms from their natural habitat to the open ground there is a material change in the conditions surrounding their young lives, and unless some artificial provision is made for shading them from the direct rays of the sun that conforms as near as possible to that of nature's nursery they will wither and die. Therefore, any one attempting to transplant forest evergreens must first be made to know and understand that

the degree of success or failure very largely depends upon the manner of digging, handling and planting; and also largely upon the size of the trees to be transplanted.

It is almost a useless waste of time to undertake the transplanting of large forest evergreens. In the taking up of large trees very many more roots will be cut and mutilated than when young seedling trees are properly dug (not pulled).

In the gathering and handling of small evergreen seedlings from the forest, needful preparations of the proper material with which to keep their roots moist must always be made; not only that, but great care must be exercised that their tiny hair-roots are never exposed to the drying influences of sun and wind; an even and continual moisture must be maintained about their roots from the time they are lifted out of their natural bed to the time when they are planted back into the ground, or there is no further value in the young trees for transplanting.

You will pardon me if I relate a personal experience that I had several years ago in procuring evergreen seedlings from the forests of northern Minnesota. I went June 1st by railroad to Duluth, and, on arrival in the morning, went directly back from the lake one-half to three-fourths of a mile up among the granite rocks and evergreen swamps prospecting for seedlings, and found an abundance of young arbor vitae three to ten inches high. These were growing along the margins of little pools of water full of moss, so the means for protecting their tiny roots when dug was close at hand. From nine, A. M. to five P. M., a helper and I dug, packed in shallow boxes and wheeled in a wheelbarrow to the depot, eighteen thousand small evergreens. I took them by express that night directly to Minneapolis. On arrival I stored them in a close, damp room until men and boys had time to sort into proper sizes, keeping their roots well protected from the drying air. Having prepared the ground by plowing and leveling, we commenced planting at once in five foot beds with the rows six to eight inches and the plants two to four inches apart. After planting, the beds were well sprinkled to settle the soil about the roots, and stakes were driven along the edges two feet high, upon the tops of which fence boards were nailed, and on these lath and brush were laid for shading. Ninety-five per cent of these trees lived and made a good growth the first season. These trees were not transplanted again for two years, when choosing a damp, cloudy day, they were carefully dug and planted in fresh made furrows in the open ground without shade, and the night following there came a heavy rain, and nearly every tree grew. Thus you see the work from the first lifting of the trees in the woods to the time of finishing the work in the open ground was well performed under the most favorable conditions, and, consequently, the loss from drying was very small.

SOILS MOST SUITABLE FOR RED RASPBERRIES AND THEIR PREPARATION.

E. H. SCOFIELD, BAY LAKE, CROW WING COUNTY.

I believe that the soil best suited to the perfect development of the red raspberry, considering flavor, size, firmness and quality, is a sandy loam. As I remember the raspberry patches of my boyhood, they were in some burnt-over chopping on a sandy soil. I have invariably noticed the same thing here in northern Minnesota. Among the thousands of acres of wild raspberries growing here, the choicest are on sandy soil or some partially shaded northern slope, near by a sleepy brook or overlooking some perfect gem of a woodland lake, whose quiet waters reflect the giant pines that guard its solitude.

I should choose a location with as little compact clay in the subsoil as possible and not more than ten or twelve feet above the water level in the soil, that sufficient moisture might be brought to the roots of the plant by persistent cultivation during the dryest season. I should choose a gentle slope toward the northeast, north or east, to avoid as much as possible the direct rays of our hot, summer sun upon the soil, for the raspberry loves the cool, partial shade as well as the moisture.

I should choose a timbered soil, rich in potash and iron, that will give vigor to the plant and firmness, color and flavor to the fruit. I should choose a place among the lakes, where the hot winds of summer would be tempered by the cool and grateful moisture and the crop protected from the late and early frosts. Such is the ideal location I *have chosen.*

As to the preparation of the soil: It has been seeded in grass, timothy and clover for several years. A heavy stand of timber, consisting of pine, oak, hard maple, basswood, butternut, birch and poplar, has been cut down and burned upon the land. This together with the leaf mold and ashes from the forests of a thousand years have laid up in the soil a store of fertility not soon to be exhausted. This grass land was ploughed last spring and planted in corn, roots and potatoes and kept thoroughly cultivated. Next spring the land will be manured with stable manure (to induce growth of wood in the young plants), ploughed deep, harrowed and leveled, and furrows running east and west will be opened with the plow every seven feet in which to set the young plants. A raspberry plantation will stand with proper care and cultivation for many years, and for this reason the preparation of the soil must be deep and thorough. Stable manure is to be used in starting the plantation to promote the growth of wood but should never be used upon a fruiting plantation, as the canes will grow large and soft and the fruit lack firmness and quality. If a fertilizer is needed, I should use bone meal and ashes and some form of potash scattered along the rows and cultivated in.

I shall set the rows east and west, that the plants of one row may protect and shade the roots of the next row and prevent drying in summer and freezing and thawing in winter.

On sandy soil you must cultivate during the whole season, even while picking, and until the plants are to be ripened for the winter. Constant, shallow cultivation will keep the roots of the plants well below the ground and bring up a supply of moisture from below.

Sec'y Latham: Mr. Scofield was a resident of this county for a good many years, but recently he has moved to Crow Wing county in this state, where he is engaged in fruit growing.

Mr. Sampson: I would like to ask if any one knows whether clay soil is better generally for red raspberries than sandy soil?

Mr. C. L. Smith: I have tried both in this county, and I have found clay soil the best.

Mr. T. T. Smith: I would like to know what is meant by clay soil? The clay soils of my boyhood in Pennsylvania were very different from what we have here. If you will explain what you mean by clay soil, whether the ordinary hazel brush soil or the black oak timber soil, then we will have an understanding of the term.

Mr. C. L. Smith: In the sandy soil that is found about here on all these flats the surface soil is rather compact, with some black loam and fine sand below; it is sand and gravel until it gets down to sand or lime stone rock. It dries out and gets very hot in July. Back where we strike the line of the heavy timber, we find a black loamy soil with some sand in it, and down from eight inches to two feet we come to a rather stiff clay, with a little gravel in it, and that is the kind of soil we have in this county where we have the best raspberry plantations. I have seen some very fine raspberry plantations on this sandy land, particularly Turners and Cuthberts, but I have never seen a successful Marlborough plantation on such land. The hazel brush soil which we find in a good many localities, edging the prairie soil, and the prairie soil, is always underlaid with a heavy clay subsoil, is very retentive of moisture, resisting the drouth. I would put it in this way: that the least desirable is the sandy soil with a subsoil of sand and gravel, and the most desirable soil is that which is a deep loamy soil, containing some sand and gravel and underlaid with clay, on account of its retention of moisture.

Mr. Harris: My idea of a good raspberry soil is one where the soil for eight to twelve inches consists of a sandy loam that works very easily and works very quick after a rain, underlaid with a subsoil that is not too retentive of water, one that the water will leach through in a few hours. My varieties do well on such a soil. The preparation of the soil should be made very deep, so the roots can go down. Then by giving frequent

cultivation and mulching bring the moisture out, preventing drouth.

Mr. Wright: Mr. President, I have something to say on that paper. In the preparation of the soil he takes ground that is very rich in the first place, and then he manures it. I believe timber ground is plenty rich enough to raise raspberries on without adding any manure. I believe you can get ground too rich for raspberries, and you get more wood than fruit. I believe in manuring old ground, but not new.

The President: That is very pertinent to the subject.

Mr. T. T. Smith: I would like to ask whether raspberries will produce fruit on our peat meadows?

Mr. Spickerman: I do not think the Cuthbert will do well on any soft land. I do not think we should have too deep a soil for raspberries. I think there can be such a thing as having too deep a soil.

Mr. Sampson: I would like to hear from Mr. Burch.

Mr. Burch: I have had a little experience in this line, and I would agree with the gentleman who just spoke. I have about an acre of raspberries on the kind of ground he mentions, and I have had them there about three years, and I have never had a full or a good crop from them, while just a few rods away to the south on high land I have had two very nice crops. My experience is that the soil does not get hard enough. So I should say it is not well adapted to raising the red raspberries, particularly the Cuthbert.

Mr. Kramer: If you want to raise a good crop of any kind in our climate, you want to go to work and set the plow just as deep as you possibly can. We must not think that when we plow we want to make it easy for the horses; if we do that we make a mistake. You have got to go to work and set your plow as deep as you possibly can. If you cannot do the work with one horse, take two, and if you cannot do it with two horses take four, but go in just as deep as you can, then you get a good foundation, and it is easy for anything you want to raise.

Mr. Spickerman: There is one point in the paper about fertilizing the land about which I wish to make one remark, and that is that coarse stable manure will do more than anything else to produce the cane rust, and it finally kills the plant out entirely; and we must be very careful about putting on the mulching. I tried it with the Marlborough. I thought I would make the ground very rich, and the first year I got scarcely anything.

In Memoriam.

ANDREW PETERSON,

WACONIA. MINN.

DIED MARCH 31, 1898, AGED 79 YEARS.

(See frontispiece.)

The subject of this brief sketch was a native of Sweden, from which country he emigrated to the United States in 1850, at the age of 32 years, being born Oct. 20, 1818. The first five years in this country he spent in Burlington, Ia., and in 1855 he came to Minnesota and located a mile southeast of Waconia Lake, and three miles from Waconia, in Carver County, and here he remained until the time of his death. Mr. Peterson had been ailing for some time, and the end was not unexpected and found him prepared.

He left a wife, the partner of forty years, and five sons and three daughters.

His early experience was not without the trials and privations incident to the life of a pioneer, but he met them with that spirit of sturdy determination that always overcomes the most difficult undertaking,and by his frugality,industry and integrity surrounded himself with all the comforts of life.

He was not only a most prosperous farmer, but as a horticulturist was well known and esteemed throughout the state. He enjoyed the confidence and esteem of his neighbors to a marked degree as well as that of all who knew him.

Mr. Peterson's name appears first on the rolls of our society in the year 1884. The extraordinary value of his services in developing our pomology was early recognized, and in 1888 he was made an honorary life member, a distinction altogether unsought by him and fairly earned by this pioneer fruit grower of the northwest. Of late years Mr. Peterson's advancing age has interfered with his attendance at our annual gatherings, but his sympathies have been with us,and his fruit has often adorned our tables. The valuable work inaugurated by the departed will undoubtedly be carried forward by his sons, as not alone their interest in horticulture but the commercial value of his orchards at their present stage will prompt the

necessary care. We hope to hear from them often. Mr. Peterson's was a well ripened life and garnered full of years.

SEC'Y.

Andrew Peterson was a man of sterling integrity and a lover of everything that he believed worked for the building up of Christian character. He loved truth, he was patient, thorough, persistent, careful and enterprising. In his very successful efforts to better Minnesota horticulture, all these features of his character were prominent, "For his heart was in his work, and the heart giveth grace unto every art."

Soon after Mr. Peterson came to Minnesota he set out quite an orchard, and among the trees were some Hibernal, which had then been recently imported from Russia in the attempt to get varieties that were adapted to this section where all those of the old list had failed. These Hibernal trees are the oldest of this variety in the state. They have now been standing about twenty-five years and have borne regularly large crops of good fruit and are now sound and good in every particular. During the last fifteen years they have attracted much attention as one of the most encouraging signs of the evolution of a system of horticulture adapted to this section. A little later Mr. Peterson planted a large number of varieties of Russian apples and brought into favorable notice the Anisim, Peterson's Charlamoff, Cross and Christmas. He also tried many native seedlings and Swedish varieties. I think he must have tried more than one hundred kinds of apples. He did not plant every variety sent out but only those that were especially promising. His location in Carver County was so far north that his experiments were of unusual interest and value to the people of Minnesota. His work, in fact, amounted to his carrying on at his own expense and in a most careful way for more than a quarter of a century what amounted to a private experiment station. He proved to the people of Minnesota that apples could be profitably grown in this section; that some of the varieties imported from Russia were especially adapted to this section and could be depended upon. He also showed that many of them were worthless, and his labor of sifting the good from the bad Russian varieties of apples has been very helpful and valuable. He was a natural investigator and freely imparted the results of his experience. His reports to the horticultural society from year to year have done much to encourage the development of pomology in Minnesota and surrounding states.

PROF. S. B. GREEN.

SPRAYING FOR THE DESTRUCTION OF INSECTS AND FUNGOUS GROWTH.

REVISED BY PROF. S. B. GREEN, MINN. STATE EXPERIMENT STATION.

PUMPS AND NOZZLES.

There has been considerable improvement made in the pumps and nozzles put upon the market in the past year, and many new pumps have been offered. Whatever the kind of pump purchased, it is important that it be used carefully, that the spraying material, if containing coarse particles, be carefully strained before use, that all parts be kept well oiled and after using that the pump be cleaned by pumping sufficient clear water through it to clear it of corroding materials.

Good judgment and considerable mechanical skill must be exercised to get the best results with any complicated machine, and only those persons possessing these qualifications should be allowed to use the pumps.

KEROSENE EMULSION.

Formula. ½ lb. common bar soap,
2 gallons common kerosene.

Cut the soap into small pieces or shavings and dissolve in about two gallons of hot water. While still hot, pour in the kerosene and with the hand pump or syringe pump it back and forth until a thick butter-like substance is formed. In this condition the kerosene is divided into very minute globules and will be readily diluted or suspended in water.

Before using, add water enough to make

(A) 10 gallons of emulsion
or (B) 20 " " "

(A) is to be used when the insects are in large numbers and the foliage is known not to be easily injured by it.

Pyrethrum Powder and *Hellebore* should be obtained in a perfectly fresh condition and be kept in glass stoppered jars.

Tobacco smoke to kill plant lice is much better than kerosene emulsion, as it is more effective, and there is no danger of injuring the tree. The outfit needed is fully described on pages 47 and 48 of the February Horticulturist, 1898.

SPRAYING CALENDAR.

PLANT.	FIRST APPLICATION.	SECOND APPLICATION.
APPLE ..... (*Scab, codlin moth, bud moth, tent caterpillar, canker worm, plum curculio*)	When buds are swelling, Bordeaux.	If canker worms are abundant just before blossoms open, Bordeaux and Paris green.
BEAN ..... (*Anthracnose.*)	When third leaf expands, Bordeaux.	10 days later, Bordeaux.
CABBAGE..... (*Worms.*)	Paris Green mixed with flour.	7-10 days later and as often as necessary until they are nearly ready for use.
CHERRY*..... (*Rot, aphis, slug, black knot.*)	As buds are breaking, Bordeaux; when aphis appears, kerosene emulsion.	When fruit has set, Bordeaux. If slugs appear, dust leaves with air slaked lime. Hellebore.
CURRANT } GOOSEBERRY } ..... (*Worms, leaf blight.*)	At first sign of worms, hellebore.	10 days later, hellebore. Bordeaux.
GRAPE.... .. .. (*Fungous diseases, rose bug.*)	In spring when buds swell, Bordeaux.	Just before flowers unfold. Bordeaux.
NURSERY STOCK..... (*Fungous diseases.*)	When first leaves appear, Bordeaux.	10-14 days, repeat first.
PLUM* ..... (*Black knot, leaf blight, brown rot.*)	When buds are swelling, Bordeaux.	When blossoms have fallen. Bordeaux. Begin to jar trees for curculio.
RASPBERRY, } BLACKBERRY, } ..... DEWBERRY. } (*Anthracnose, leaf blight.*)	Before buds break. Bordeaux.	Bordeaux just before the blossoms open.
STRAWBERRY ..... (*Rust.*)	As soon as growth begins, with Bordeaux.	When first blossoms open, spray young plantation. Bordeaux.
TOMATO..... (*Rot, blight.*)	Before appearance of blight or rot, Bordeaux.	Repeat first if diseases are not checked. Fruit can be wiped if disfigured by Bordeaux.
POTATO .... (*Flea beetle, Colorado beetle, blight and rot.*	Spray with Paris Green and Bordeaux when one-fourth grown.	Repeat before insects become numerous.

*Black knot on plums or cherries should be cut off and burnt as soon as discovered.

THIRD APPLICATION.	FOURTH APPLICATION.	FIFTH APPLICATION.
When blossoms have fallen, Bordeaux and Paris green.	8-12 days later, Bordeaux and Paris green,	10-14 days later, Bordeaux
14 days later, Bordeaux.	14 days later, Bordeaux.	Spraying after the pod is one-half grown will injure them for market.
10-14 days if rot appears, Bordeaux.	10-14 days later, weak solution of copper sulphate.	
If worms persist, hellebore.	After fruit is gathered, Bordeaux.	
When fruit has set, Bordeaux.	2 to 4 weeks later, Bordeaux.	2 to 4 weeks later, if any disease appears, weak solution of copper sulphate.
10-14 days, repeat first.	10-14 days, repeat first.	10-14 days, repeat first.
10-14 days later, Bordeaux.	10-23 days later, Bordeaux	10-20 days later, weak solution of copper sulphate.
(Orange or red rust is treated best by destroying the plant.)	Spray after fruit is gathered with Bordeaux.	
Spray young plantation with Bordeaux.	Repeat third if foliage rusts.	
Repeat first when necessary.		
Repeat for blight, rot and insects as potatoes approach maturity.		

*For aphides, or plant lice, use kerosene emulsion on all plants.

INSECTICIDES.

While there are many new insecticides offered, there is so little exact knowledge of their effect upon farm and garden crops that until further trial is made we can only recommend for general use Paris green and hellebore for chewing insects and kerosene emulsion for sucking insects, with pyrethrum,or insect powder, in a very few cases.

FUNGICIDES.

BORDEAUX MIXTURE:

Formula. 5 lbs. Copper Sulphate, (*Blue Vitriol*).
5 lbs. Caustic Lime, (*Unslaked Lime*).
50 gallons water.

The process of making Bordeaux mixture has been improved very much during recent years.

Dissolve the copper sulphate in hot or cold water, always using either an earthernware or wooden vessel. Slake the lime carefully,so that it does not burn nor yet have too much water. When ready for use, dilute each ingredient and pour them into one barrel. It is best to pour the lime and the copper sulphate in at the same time, for the mixture will be better.

A satisfactory test as to whether there is sufficient lime to neutralize the copper sulphate is to dip up a saucerful of the mixture and blow into it. If there is enough lime, there will be formed a thin pellicle on the surface.

Should the lime be air slaked at all, more than five pounds may be needed, as it will have lost much of its strength.

This fungicide is recommended as more satisfactory than any other, from the fact that it adheres a long time to the branches, buds and leaves and seldom causes any injury to the foliage.

It has been found more effectual if made up fresh for each application. Two or three thorough applications give better results than many light ones.

When both fungous growth and insects attack a crop, Paris green should be applied with the Bordeaux, as in a combined state both are as effective as if used singly, one-half the labor is saved, and there is less danger from injury to the foliage by the Paris green than if used alone.

DILUTE COPPER SULPHATE SOLUTION.

After the fruit has nearly matured it is often disfigured by the adhesion of the Bordeaux mixture, and in place of the ammoniacal carbonate of copper recommended, we would advise the use of copper sulphate,2 oz. to 50 gallons of water. The foliage of many plants will stand a much stronger solution, but this is as concentrated as can be generally used.

Calendar for May.

PROF. S. B. GREEN, MINN. STATE EXP. STATION.

Red cedar seed sown a year ago did not start last season. The bed was covered about one inch deep with hay. I find now, April 10th, that almost every one is starting; some of them, in fact, are above ground.

Arbor vitæ flowered this year before April 12th, and at that date some of the flowers had already dried up. Buffalo berry were in full flower by the 18th, and these early flowering plants set fruit with great certainty. I wish that our cultivated fruits had flowers as hardy against frost.

We got in our onions and sweet peas the 12th of April and had them covered with a light snow, which was far better than a rain would have been.

The planting of strawberries will ordinarily commence about the first of May. There are many new candidates for favor this season, but as yet I know of no varieties that are more promising than the older sorts recommended by the State Horticultural Society. Among the best perfect flowering kinds are the Lovett, but I have heard reports about its not standing well over winter, although it has shown no such weakness at this station. In transplanting strawberries it is very desirable to use some of the transplanters which take up a ball of earth with the plant. Plants moved in this way seldom fail and seem hardly to know that they have been moved. It requires a little more time than to set in the old way, but it pays. I think this year we shall put strawberries in rows six feet apart; heretofore we have put them four feet apart, but the six feet interval allows plenty of room for the mulch when it is taken off the plants, and it is then easily accessible for covering them if the plants are endangered by late frosts. It is important to uncover all plants before the buds start into leaf; if, however, you find the buds have started a good deal when you come to uncover them, I think it is desirable to leave a little of the loose mulch on, especially in case of strawberries, to partially shade them should the weather be very bright and dry.

Stock that was dug and heeled in last month may still be planted, and if the weather is favorable it will be found that many of our

garden plants can be set out even after they have started quite a little, if much care is used.

If you have some of the newer kinds of suckering raspberries that you wish to increase rapidly, it is a good plan to take up the suckers that come from the roots early in the spring when about four inches high and set them carefully in rows in moist soil, and they will make a very good growth by autumn and become just the nicest kind of plants to set next year.

By the middle of the month, it is often safe to plant in the open ground the tropical vegetables, such as squash, cucumbers, melons and beans, although nothing is gained by so doing if the ground is not warm, and it may be best to wait ten days longer. Corn is generally planted by the middle of May, and in early seasons it is a good plan to venture a little of some very early kind during the first week. Peas should be planted for succession, and cabbage and cauliflower for autumn and winter use.

The first of the month is a good time to start melons in frames or hotbeds. Do not crowd the tomatoes and do not set them out too early—better not get them out until after the first of June. If set out so early that they are frozen off, and you still have a few left in frames, remember that you can double the quantity that you have in the frames by cutting off about six inches of the top and treating the cuttings the same as gernanium cuttings.

If late frost comes as the potatoes are pushing out of the ground, plow a furrow directly over them, covering them up with soil.

The plum curculio will make its appearance shortly after the fruit is set, and, while it has been recommended to use spraying mixtures for them, yet, so far as I have been able to ascertain, they are all of them unsafe, and the best remedy is jarring the trees once a day or once in two days early in the morning and catching the beetles when they fall onto the sheet. This can be done quite easily, and it takes but little time.

The tent caterpillar will make its appearance just as the leaves begin to unfold. I notice there are quite a number of their egg clusters in the branches of our plum trees. If they are watched a little, it is a small matter to destroy them before they have done any harm, but better still to destroy the eggs; very often they are allowed to grow until they have made much growth and are conspicuous and are then destroyed, but it is a mistake to let them have their own way so long.

It is as true with the plum lice, or aphis, about getting at them early as with the curculio and tent caterpillar; and if the trees are watched and sprayed with tobacco water and kerosene emulsion on the first appearance of the aphis this insect can generally be kept in check without much trouble, while if allowed to increase until they become very numerous it is almost impossible to destroy them by these means.

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NEW BUILDING OF THE PHILADELPHIA HORTICULTURAL SOCIETY.

[See Secretary's Corner.]

THE MINNESOTA
HORTICULTURIST.

VOL. 26. JUNE, 1898. No. 6.

Vice-President's Reports, 1897.

(Made at the Annual Meeting, Dec., 1897.)

VICE-PRESIDENT'S REPORT, FIRST CONG. DIST.

E. H. S. DARTT, OWATONNA.

Mr. President: In regard to the first district, so far as I know the fruit crop has averaged very light. In raspberries and strawberries at our place, there has been about one-half a crop; I have not investigated the apple crop, but in our vicinity I do not think the crop was more than one-tenth. There was one peculiarity in regard to the apple crop, the success went in streaks. Some orchards seemed to have a fair yield, while others produced, you might say, nothing. The trees that produced apples were on the highest ground and where they seemed to be exposed most to a free circulation of air. I noticed particularly a tree in my locality that stood on the top of the bank of a ravine; it was about fifty feet to the top, and that tree was exposed to the west wind. It hung full; there were more apples on it than on any other tree I saw during its season. I think from that we can judge that a free circulation of air is absolutely necessary. I think the man whose orchard produced the most apples, according to the number of trees, was Mr. Buffum. He has the highest ground; his orchard is on the highest ground I know of in that section of country, and he had quite a fair crop.

In regard to the advance in horticulture, it seems to me it is rather slow. People are planting a good many trees, and with the advantages of the present tree peddler we might suppose there would be some progress, and perhaps there is, but it seems to me that the greatest discouragement we have to contend with is the very thorough manner in which the country is canvassed for the sale of

trees not adapted to our climate. There is no use for a man to undertake to sell trees if he is obliging enough to tell the whole truth as far as he understands it; but they tell fine stories and show fine fruit, the people bite, and they sell them trees at high prices. They tell them a good lie and stick to it. They say a lie well stuck to is as good as the truth, and if that is the case in regard to canvassing for trees I believe it holds good.

VICE-PRESIDENT'S REPORT, SECOND CONG. DIST.

S. D. RICHARDSON, WINNEBAGO CITY.

The frost the last of May of this year (1897) seriously injured the fruit crop all over this part of the state. It was the off year for apples, yet in spite of the frost there was a fair crop in some localities.

Jack Frost is always supposed to be full of his freaks, but last spring I think he did just as he pleased, without any apparent reason. I saw Wealthy apple trees on land that was lower than the general level loaded with fruit, while near them the corn was killed to the ground.

On our own grounds the apples were injured, but all the trees that blossomed bore some fruit, and I could not see that trees on the lower ground were injured any more than they were on ground seven or eight feet higher.

We have never found it necessary to plant plum trees in groups in order to have them bear, but they are set around among the apple trees, sometimes one and sometimess everal in a place. On the west side of the orchard the plum blossoms were all killed, while on the east side they were not injured in the least, but apples growing close by them were more than half killed. Plums, both wild and cultivated, bore a light crop.

Grapes were killed by the frost but set again and bore about one-fourth of a crop.

Strawberries were seriously injured, but on low ground where all mulch was removed after the frost, the rows narrowed up and the ground thoroughly cultivated, they bore late but very heavily. We have had best results with strawberries when there have been late frosts on ground from which we removed all mulching early in the spring for the ground to thaw out, so we could dig plants early.

Raspberries were good in some places, in others the borers or something else killed the canes after the fruit set.

Gooseberries and currants were a fair crop.

There has not been a full crop of small fruits all through this district for the last four years, while apples and plums some of the years have given the best of results.

In submitting a fruit list for the Second Congressional District, I will say that it is a little different in some things from what I would recommend a customer to plant. In common with other nurserymen we have some choice things that we are introducing and wish to do so through our agents. After they are thoroughly

tested by the public, the horticultural society can recommend them if they see fit.

Chas. Luedloff writes me in regard to the Kaump apple. "It is free from blight, a fine upright grower and perfectly hardy," It is bearing freely in this section of the country. Set the Wealthy and Kaump side by side at the same time,and the Kaump will bear fruit enough to pay for the first cost of tree, the rent of the land and care of tree, before the Wealthy will bear any fruit.

I have not recommended anything but what can be bought at the common price both in Minnesota and northern Iowa.

FRUIT LIST.

Apples.—Duchess, Wealthy, Hibernal, Tetofsky, Kaump and Longfield.

Crabs and Hybrids.—Virginia, Whitney, Minnesota, Briar Sweet and Early Strawberry in limited quantities.

Plums.—Forest Garden, Desota and Miner.

Grapes.—Concord, Worden, Agawam and Champion.

Raspberries.—Turner for red, Schaffer for purple, Gregg and Souhegan for black.

Blackberries.—Ancient Briton and Snyder.

Currants.—Stewart, Victoria, Long Bunch Holland and White Grape.

Gooseberries.—Downing and Houghton.

Strawberries.—Crescent, Warfield and Bederwood.

VICE-PRESIDENT'S REPORT, THIRD CONG. DIST.

MRS. A. A. KENNEDY, HUTCHINSON.

In some localities the berry crop was fairly good, in other parts it was almost an entire failure. In my own yard strawberries were not over one-half a crop. They were not touched by the frost, but I think we must have injured them by covering and uncovering them; I think we must have disturbed the pollen. Blackcaps did well with me; some of my neighbors complained of their bushes dying.

I traveled down through the state by team; went down through St. Peter, Mankato, Mapleton, Wells and across the Iowa line as far as Plymouth, and coming back by Albert Lea astonished our brother, Clarence Wedge, by calling at his house about bed time. Here we saw the first fruit that was worth mentioning. In the morning he took us through his grounds, and, O my, what a sight greeted our eyes (and mouths, for that matter)! His apples and plums were magnificent. Away down in the meadow, on a little sandy knoll, we saw a strawberry bed, and, as I am a woman, I shall say it was *just lovely*. As we came up this way we saw three small orchards where the trees hung quite full. As we were going down, just before we came to New Auburn we stopped to feed, and I went into the garden where they had some apple trees growing, and every tree he had was badly blighted but his Peerless; they were all looking nicely except one that had died.

VICE-PRESIDENT'S REPORT, FIFTH CONG. DIST.

JOHN H. STEVENS, MINNEAPOLIS.

The past year has been propitious to fruit growing in Hennepin county, particularly in small fruits, such as blackberries, raspberries, gooseberries and currants. There is not much profit at present in growing small fruit, as you have to compete with the southern fruit growers, who supply our markets at greatly reduced prices.

The apple product was fair, but not large. I am indebted to several persons for choice specimens of the apple, especially to Mr. Cummins, of Eden Prairie, who sent me Winona Chief, or Utter Red, Wealthy and seedlings of superior quality and of much merit. The latter, through Prof. Green, are placed on exhibition. I earnestly recommend them to the attention of Mr. Harris, to report upon their excellence and long-keeping qualities.

The product of the grape was abundant, the Concord and Delaware still leading in profit to other varieties. The vicinity of Minnetonka is favorably adapted to this fruit, and more than thirty varieties have been there profitably and successfully raised. Evidently this section will prove the future home of this fruit.

The wild plum was plentiful. The tame sorts, not as yet being very extensively cultivated. Hope they will be in the near future. The new hybrid between the *prunus pumila* of the old botanist, or *prunus besseyi* of the new botanist, and some of our plums—has not been generally cultivated in this county. We hope it will prove of value in the plum line. We have much to expect in the future from the general system of hybridizing, and in this connexion, in my humble way, I wish to express the great satisfaction I have in witnessing the great benefit the experiment farm and Prof. Green, at the head of the horticultural department, are to the fruit growers of Minnesota.

VICE-PRESIDENT'S REPORT, SIXTH CONG. DIST.

MRS. JENNIE STAGER, SAUK RAPIDS.

We have been very much pleased this past summer with having a much larger amount of fruit than we had any reason to expect. The frequent rains of spring helped the strawberry crop, and we, as well as our neighbors, had an enormous crop for the amount of plants we have. Currents, gooseberries, raspberries, apples and plums surprised us in the same agreeable way.

All of the plants sent by Prof. Green are alive and grew finely with the exception of one Harrison's Peach, a plum. A great many of the plum trees sent me from the experiment station a few years ago fruited this year, but I will reserve my opinion for another year's fruiting. In our section of the state the harvest of this year has quite encouraged us in the planting of fruit. At the State Reformatory, also, more fruit planting was done by Superintendent Houlton this last spring (1897) than for several years past.

VICE-PRESIDENT'S REPORT, SEVENTH CONG. DIST.

J. O. BARRETT, BROWN'S VALLEY.

Voluntary applications to our nurseries for fruit plants and what were obtained by canvassers representing the nurseries, aggregate large quantities introduced into the sixth district during the sale year. As to a healthy growth, on a general scale, of such and forest seedlings, it is not equal that of some past years. The deficiency is traceable mainly to the undue wetness of the early summer. It demonstrates the necessity on our part of underground drainage, an application essential to practical irrigation by which water can be held in abeyance during a drouth and its surplus allowed to flow into reservoirs for pumping back upon the plants when they are thirsty. The best thing we can do is to wisely economize every drop of water that falls to us from the clouds.

The frosts of last spring, occurring when the trees were in blossom and the fruit just forming, did serious damage in our district. The incipient fruit of cherries, apples and most of the small fruits was destroyed or greatly injured. It was noticeable that where the currants or gooseberries were thick, on an average about half a crop of small berries was raised. They would have been of such grade, even if we had not been visited by repeated frosts; for where no thinning of the bushes is done, the size must necessarily be small. But better is small than none at all. It is a well known fact that where the stems of plants are close together, as they naturally grow, they mutually protect each other against a chill. It may not always be wise to depart from nature's method.

Ours is the coldest congressional district in the state. Under the adverse conditions of the situation, it is no little task to induce our farmers to engage in the fruit industry at all. If told that they must thin out so and so and provide some kind of protection to spread over the exposed plants when Jack Frost makes his usual visits or have no berries worth raising, ten chances to one they will give the nursery agent a savage, "No!" Having repeatedly failed, some of our farmers have abandoned fruit raising of every description. No wonder they are discouraged, for they have not made the necessary preparation for it in tree protection and condition of soil. Others have started windbreaks on their farms and otherwise complied with the pre-requisites, and are hopeful for results.

The entire district is well adapted to raising plums indigenous to the state, including the standards. As a rule, strawberries have not proved a satisfactory crop, but we are gaining with this delicious berry as the years come and go. When properly managed, currants, gooseberries and raspberries are a success. High bush blackberries are generally a minus quantity, mainly because they begin to ripen during the drouth season. The dewberries are more reliable. Though not equal to some other cherries, the sand cherries are welcome because they are so hardy and generally bear a prolific crop. I am looking for a choice selection of this cherry whose berries in size and quality will place it in general demand.

The dearth of forest and fruit plants in the sixth district and else-

where on the northern prairies presses home the oft considered question, what can be done practically to overcome it? However successful or unsuccessful any of us may be in our different localities, is it not our duty to employ more efficient methods by which to carry on our horticultural work throughout the state? In Austria and other nationalities of Europe, forestal and horticultural practices are made an inseparable factor of education. The horticulturists of New York are moving step by step in the same direction, and that, too, with admirable success. For several years the forestry association has agitated the teaching of rudimental forestry in our public schools, and the responses from county superintendents has been very encouraging. The subject matter will no doubt be discussed at the next annual meeting in January, of the association, and conclusion drawn as to what can be done practically. The horticultural society has ever been the foster patron of forestry, ever appreciating the fact that there can be no successful horticulture without forestry to protect fruit plants against destructive winds. If we unite forces in a common cause, the dawn of the twentieth century will be demarked by horticulture and forestry in our educational curriculum, and missionary work successfully doing in every county and town in the state.

MY SUTTON'S MATCHLESS CUCUMBER.

(The English Frame (Seedless) Cucumber.)

MRS. M. A. CUZNER, ESSEX AND 27TH AV. S. E., MINNEAPOLIS.

The seed was sown early in May in small pots and placed near the stove. When well up, they were kept in the greenhouse by day and taken into the house at night, for the reason that I have no heat in my little greenhouse. As soon as the tomato plants were grown, they were planted out on the benches in the greenhouse in good soil, composed of cow manure (two years old) about one-third and rotten sod two-thirds. My benches are not more than six inches deep, but eight would be much better. As early in the afternoon as the temperature will allow (not above 80°), I close the house and syringe the plants, using clear water that has stood in the sunshine all day.

These cucumbers can be grown in a hotbed, but do not look quite as well, as they bleach a little on the under side and do not grow quite so straight or large. They have very few seeds and are much better in flavor than the common cucumber. I cut two twenty-six inches and others eighteen to twenty-four inches in length.

Those who attended the last state fair may remember seeing two of these cucumbers displayed on the shelves just above the refrigerator cases. They attracted a great deal of attention, and we know they are fine flavored from actual test.

Sec'y.

THE RASPBERRY AND BLACKBERRY IN WINONA COUNTY.

L. R. WIDMOYER, DRESBACH.

Winona county is situated in the southeastern part of the state. The surface of this county is undulating, or hilly. It is more uneven in the eastern and northern parts than in the western and southern parts. This is owing to the fact that all the large drainage valleys are in the eastern and northern portions of the county.

Along the Mississippi river the land lies in terraces. These are more noticeable in some parts than in others, and they disappear altogether as you go farther inland. The land then becomes more rolling. Many valleys branch out from the Mississippi river and extend back into the county. These valleys send out tributaries which intersect, making a perfect net work of hills and vales all over the surface of the county.

The soil of these valleys is generally well adapted to the growing of the raspberry and blackberry, but the industry is chiefly confined to a narrow belt along the Mississippi river. There are, however, several farms farther inland where raspberries and blackberries are grown. The soil of the county is a loose loam but differs in some localities. In some places there is a rich, black sandy soil, while in others we find a sandy clay loam. On the new timber land and in some of the narrower valleys, the soil is a moist, loose clay with a layer of humus on the surface.

The subsoil is usually open clay but in some places consists of a layer of gravel next to the surface and then a layer of clay under that. In some portions of the county the subsoil consists of a hard blue clay. The soil over this is very wet.

The climate of the county in winter is not very favorable for these two fruits, consequently they must be carefully protected. The climate in summer is just the opposite. It sometimes gets quite dry, in summer, and irrigation becomes necessary, but this is not the case every year.

It is a disputed question as to which slope is the best for raspberries and blackberries. Some say a northern slope, for it is not subject to drought to the same extent as other slopes. Some say the southern slope, while still others say the eastern. I have concluded from observation that it doesn't make much difference what slope is selected in Winona county, that is, if proper care is taken to protect the plants. I will not say that this would hold good all over the state, but I am satisfied that it is invariably true in the berry district of Winona county, because of the way the land is cut up by valleys. In these narrow valleys the fruit is protected as much on one slope as on another. I have seen this proved in more than one instance. A good illustration can be had if one will take the time to go over Mr. H. Decker's fruit farm. This farm is back a mile or so from the river, and lies on several different slopes. Mr. Decker has raspberries and blackberries on an eastern, on a southern, on a northern and a small portion on a western slope. He says that he has had very good

crops from each. He has also had poor crops from each, and he can see no difference in any of the slopes. He would, however, prefer the northern slope for blackberries. He has a small patch of blackberries on the top of a high ridge, (about 1000 (?) feet or more), protected by a light windbreak. These canes do as well as any he has but have to be carefully covered in winter. About the same thing can be said of Mr. Carson's fruit farm farther west, and the same thing holds true on the small fruit patches around my home. Almost all the fruit farms along the Mississippi river lie on eastern or southern slopes.

Almost any elevation desired may be had in the county. I have heard men remark they could not raise these two fruits on the high ridges, while others, whose farms are almost in sight of theirs, are making a success with them. This is because these men have gotten the impression, in some way, that they can just sit still and the berries will take care of themselves.

I think all the good varieties we have in the state can be cultivated in Winona County. Of the red raspberry, we have, first, the Marlboro; second, the Cuthbert; and third, the Loudon, a promising new variety. The Golden Queen is also cultivated. Of the black raspberry, we have Spry's Early, Palmer, Kansas, Gregg and Nemaha. Spry's Early and Nemaha are the most susceptible to cane-rust. Of the blackberry we have, first, the Ancient Briton; second, the Snyder; and third, the Mammoth Cluster, which has been cultivated near my home for twenty years or more. It does'nt yield quite as heavily as the others. I think the Ancient Briton is far ahead of the other varieties in this section.

About the same process is employed, by all the fruit growers in this section to bring the soil into a proper condition for planting. But in some cases where we find a "Don't care how it is done" man, not enough care is taken, and success is not met with. Fruit raising is then condemned by these men who say the climate is unfavorable or the soil is'nt of the right kind, while another man, possibly in the same locality, will be making a success of it.

The land is plowed in the fall, very thoroughly, and then left until spring, unless a heavy coat of fertilizer is needed. In the spring, it is again plowed and brought into the best condition possible. Planting should commence as soon as the ground is prepared and the plants can be taken up, usually after the plants have started into growth. There are several methods employed by the growers in Winona County, but they all amount to the same thing in the end. I will mention only one way.

First, mark out the land seven and one-half feet one way, and three and one-half feet the other. Eight feet by four feet will be better if you have the room. Plow a furrow with a small plow in the seven and a half feet marks. Then set a man and one or two boys at work. The man follows the furrow and loosens the soil at the three and one-half feet intervals, with a spade. The first boy takes two good plants, carefully spreads the roots out, places them where the soil has been loosened, and pulls some of the surface soil in on them, firming the plants in their places. The second boy com-

pletes the operation by filling in around the plant with a hoe. The cultivator will do the rest by smoothing down the furrow made by the plow. The red and black raspberry and the blackberry can all be planted by this method, but one plant of the black raspberry will be sufficient in a place. Then, too, blackberries should be planted more carefully, as usually they hav'nt many fibrous roots.

After the plants are set, care must be taken to keep out the weeds. In order to do this, some growers run the cultivator through every two weeks, at the least. If it is very dry and the surface becomes hard, it will be necessary to cultivate oftener and after every rain. They should be hoed nearly as frequently.

Some fruit growers in Winona County claim it is'nt necessary to lay these two kinds of berries down in the winter, but I find if a crop of nice berries is expected the following summer it is best to lay them down. The canes should be trimmed and laid down the first fall and taken up as soon as the frost is out of the ground, or as soon as it gets warm enough to start the new growth. The second year they should be plowed. After they are plowed, smooth the surface down with the cultivator and hoe. After the second year, it becomes necessary to support the canes in some way. A good method to employ and one which is employed extensively where I live (by nearly all the growers), is to set a post at each end of the row, and if the rows are long to set as many as are needed between these. A cross piece is then bolted to each one of these posts. A No. 16 galvanized wire is now stretched around the row and stapled to these cross pieces. If the support is not strong enough, drive stakes where they are needed and staple the wires to them. There are many other ways which accomplish the same result, but this makes a very neat support if the right man does the work. By this time the canes should be in a strong growing condition. The field should be plowed and hoed in the spring and fall of each succeeding year. The old wood and diseased canes should be cut out every fall. The trimming or pruning is done in the usual way, in the spring.

Insects and diseases do not annoy us much, but they are coming gradually, and I fear we shall have to fight them hard before long, if something is not done very soon. A few canes in a field are infested by the cane borers. I found this summer that quite a few of the blackberry plants were covered with red orange rust, and here and there among the raspberries I could find a plant with leaf curl. The cane rust is showing up on the black raspberry, the Spry's Early and Nemaha especially. We have been doing little to check these diseases, so they have gained ground on us, but during the last year the growers have commenced to see the damage which is sure to be the result of two or three years longer neglect, and some are taking measures to exterminate them.

GIVING SEEDS AN EARLY START IN THE GARDEN.—The ground is often cold when the seed is put into the garden plot. To get the earliest vegetables, have a few boxes without bottoms and with a sliding pane of glass for a top. Let the top slope toward the sun. Shut the slide entirely until the plant breaks ground, then ventilate as one would in a hotbed. A few such boxes will make some of the garden products ten days earlier—worth trying for.

GIRDLING TO PRODUCE EARLY BEARING.

E. H. S. DARTT, OWATONNA.

I commenced girdling about three or four years ago. I was in the orchard, the experimental orchard, and I noticed a limb on which were four or five nice apples, and that tree did not have another apple in sight, neither that tree nor any other tree. I discovered that a twig had been girdled by a label wire; I had been careless and let it remain, and the limb became girdled and produced apples. From that time on I have been girdling quite extensively. I first girdled by removing a ring of bark around the tree with a knife. I made a clean cut right around the tree about one-eighth of an inch wide and took that bark out in June, and the next season the tree blossomed, and there was an abundance of apples. I got a great many apples in that way. The next year I commenced to girdle by what I call the spiral method; I took a saw and sawed around spirally until I got around the tree; I sawed clear into the wood. You have got to go clear into the wood. That plan also worked well. There were but a very few trees that were girdled in that way that died. I suppose it induced bark blight or sun scald, and some of them died. Girdling has the effect of throwing the trees into bearing. I have many young trees that have borne well this past season; trees that were girdled blossomed profusely; there was a great crop of little apples, about as big as peas, when that freeze came along about the first of June and made a clean sweep of everything. I did not get any apples, but the effect was visible in the large setting of apples. Then, later on I girdled by a different method. I girdled by what I call the surface method. Down close to the ground I sawed away a piece with the saw. I cut about half way around the tree on one side; then a little higher up or lower down I cut half around on the other side. That method is the best of all.

A good many of the trees were attacked with bark blight and died, but those that died were generally of doubtful character as to hardiness and a little inclined to blight. Healthy, strong, well established varieties were not much affected that way. That I shall treat of in my tree station report. I shall give all these conditions of fact. Many object to girdling because it will kill the trees. Of course girdling means to kill. You need not be afraid that it will kill in May or June, and if you are a little afraid just take limbs and try it for once. I have trees that have been twice girdled and been brought into bearing by girdling, and they are now in a good, healthy condition. Of course, this season I am delighted with the effect; I have killed so many trees. (Laughter). I think it is a test of hardiness; it is just as good as a hard winter. We do not know what they are worth in those mild winters. I had over one thousand grafted varieties, and I know in the ordinary course of things a great many of them must be worthless; perhaps $\frac{99}{100}$. I have a lot of seedlings grown from the original planting of seeds of which $\frac{99}{100}$ will prove worthless on account of blighting or poor quality of fruit, for want of hardiness or something else that an apple tree is

liable to be affected by. I do not know that there is anything further I need to say at the present time, because I expect to treat of the matter more fully in my report which I intend to write.

Mr. Harris: In one way I agree with Mr. Dartt, that if you take all the bark off it will not always die. As far as that goes I agree with him, but I do not believe that the orchardist of Minnesota had better try girdling to a very large extent in his orchard. I know from an experience of from fifty to sixty years that the girdled tree may heal over and look perfect, but the inner wood is damaged, and it hurts the tree just as much as it would a man to run him through a threshing machine, for instance. But it is a good idea to get those trees out of the way if they are worthless.

Mr. Kramer: I have tried a different method in former years to a considerable extent. I have always heard from my father, who is dead long ago, that when you want to plant a tree and make it grow, find out the sun side and set it on the sun side. He was very good at finding anything out; we did not have those books to read, but he always worked for himself when he was after anything, and he never cut a tree in any way except on the north side. He never touched the south side; he said the south side had trouble enough without cutting. He always cut the north side in step-like form clear down to the roots. The north side is always much softer and the sap will run through and make the tree bigger.

Mr. Somerville: When a man has as many trees as Mr. Dartt has he can afford to experiment, but I will say that it is a very dangerous experiment to try an orchard. I have tried it, and I have killed some fine trees. I was out at Mr. Dartt's place last spring and saw where he had girdled a great many trees. When I got home I thought I would try it, and on the 16th day of June I girdled about twenty trees four or five inches in diameter. The result was I killed nearly two-thirds of those trees, or they are as good as dead. They have all blighted on the southwest side. It is the first trouble of the kind I have ever had on my place. You understand it is the result of a violation of the laws of nature, and we are only earning our reward for such violation. If we must kill trees we might adopt some quicker method. I think if you girdle a tree for three years the only thing it is then fit for is the brush pile. I tried it twenty years ago when in the nursery business. I tried different varieties in order to hurry them along; I would, perhaps, get two or three apples, but it was at the expense of the loss of the tree. I never had but a few trees that were worth anything afterwards. I do not think the practice should be recommended.

Mr. Dartt: What varieties did you girdle?

Mr. Somerville: I can hardly tell you at this time. I have girdled some of the Brett's seedling that were large trees; I have girdled the Arcade. I cannot tell you all the different varieties I have girdled, but I think one-third of them are as good as dead.

Mr. Dartt: Do you know that they never blighted before?

Mr. Somerville: They never blighted in the world. I will tell you, the Arcade never blighted in the world. I killed two of those trees I would not have taken twenty dollars apiece for. If you

girdle them and you run a little past the place where you started in to girdle, you will be sure to have a black spot at the place where you come out, as the sap cannot circulate between those two places. I think you get the idea. Unless you stop just opposite the place where you started in, you had better not start at all. That is the place where you will have a black spot every time.

Mr. Harris: It will show all the wood below for several inches down in a few years.

Mr. Van Houten, (Iowa): This principle of girdling is the same in Iowa as it is in Minnesota. We have heard the two extremes here. I believe there is a happy medium. I believe there is a certain principle which, if observed, will bring good results. If you have an apple that is hardy, like the Northern Spy or the Bellflower, and can hasten its productiveness by girdling, the danger is in doing it out of season. The season to do it is when the cambium layer is formed, but if you wait until the sap is thick then it will not cover the tree, and the tree will be killed. If you do it before that mucilaginous substance is formed you will kill the tree also. There is a time when you can girdle the tree without injury, the only exception being that when the sun is very hot it will blister the tree. If the heat is not intense the first twenty-four hours, you may depend on it that the tree will live. You can girdle the tree under the conditions I have told you, and I can guarantee that you can take one hundred trees and girdle them every time; you can take off one inch or three inches, and I will guarantee that not one in a hundred will die; but if you do it too early or too late, it is positive death. I would recommend it only in varieties that you can spare, or something that you want to fruit early. By girdling the limb you get fruit much earlier, but you want to have judgment enough to know when to do it.

The President: What is the theory of girdling to induce early fruiting?

Mr. Van Houten, (Iowa): It stops the downward flow of the sap and causes the fruit buds to perfect themselves for next year.

The President: It induces a shock to the circulation and growth of the tree and that induces early fruiting next season, but it really produces no injury to the growth of the tree. Is that right? Now if you do this at a season of the year when you do not injure the tree, when this cambium layer is formed, or this mucilage is there, and it does not produce a shock to the tree, how does it induce fruiting?

Mr. Van Houten, (Iowa): I think during the time the sap is covering up that wound, that is the time when those fruit buds are formed. I have tried it on whole rows of trees and without the loss of a single tree. You can go on and girdle, and you will find that once in a while a tree will live no matter when it is girdled. Some of them will have vitality enough to recover; but after about the first of July you will find your trees will die.

Mr. Dartt: As there are a great many here who will not be present when my report is read, I will just say a few words more. I have girdled a good many trees; I have girdled, I think, not less than one

thousand trees in my own orchard, Duchess trees, and I have yet to see the first tree that shows any signs of injury. The Duchess will stand girdling, but a great many varieties are so thin skinned they will not stand girdling. It will induce blight and sunscald, and they are likely to die. I have a good many trees that I have brought into bearing by girdling, first by the spiral method, then by the surface method, and they are now in fine condition. The CZ I mentioned is one of those trees; it has been twice girdled; it has been manured and cultivated and twice girdled, and yet the tree is in fine condition. The Hibernal stands girdling very well. I girdled a whole row of them, and I guess only ten per cent of them were killed. Some trees are more likely to be killed by girdling than others.

Mr. Wragg, (Iowa): Is it not safer to girdle one-half of the tree one year and the other half the next year? Perhaps my friend Somerville girdled too many trees at once. The first I girdled were only girdled half way around on the north side. I knew there was a greater circulation on the north side, so I girdled only half way round. I am not afraid to girdle any hardy tree, as I know it will not kill it if it is judiciously done. This idea of having them go for us—I rather expected it, and it is not the first time a man has suffered for advocating something that was not popular. My friend Harris gives it as his opinion that it is a practice not safe to follow, but I think he will change his mind when he gets a little older and knows a little more. (Laughter).

Mr. Pond: Do the beneficial results of girdling extend over more than one year?

Mr. Dartt: I think it is a very good theory not to girdle one year, then the wound will grow over more thoroughly, and the chances are that its effects will last for two or three years, and then you will have to girdle again on a very hardy, thrifty growing tree.

Mr. Van Houten, (Iowa): There is another principle that has not been mentioned. We have a great many varieties that bear alternate years. Take the Jonathan for instance; it is a great advantage to girdle because you can throw it into bearing every year. That is one of the advantages of girdling in our country.

Mr. Spickerman: Do you girdle the tree more than once?

Mr. Van Houten, (Iowa): Only once; it is just done for the purpose of bringing it into bearing the year it would not bear. For instance, this next year is the bearing year, and you girdle it then, and it changes the fruiting year.

Mr. Spickerman: But trees can be girdled more than once, can they not?

Mr. Van Houten, (Iowa): Young trees that are thrifty and full of vigor can bear this year and next year also, and by girdling you change the fruiting season. They can be girdled more than once, but it is not necessary when done for that purpose only. When we are talking about the flow of sap a good deal of it is theory, and we can only change the results in the way I have indicated.

Mr. Bush: I think another advantage we derive from girdling is this: I am testing it now and have failed to kill a single tree. I I have an orchard that is planted too closely; I planted my trees

closely because one tree will protect another. I am girdling every other tree in those rows, and I expect to bring those trees into bearing early, which is one advantage of girdling. If it kills them it is all right, as I expect to get rid of them later. I think I can have half of that orchard come into bearing early, and the other trees will not be injured by not girdling them. In that way I can protect my trees by close planting and have desirable results follow.

Mr. T. T. Smith: How close do you plant to get those results?

Mr. Bush: I planted those trees ten feet apart. It is altogether too close to let them remain.

MINNESOTA AND ITS ADVANTAGES.

REMARKS BY PROF. W. W. PENDERGAST.

Mr. President: I can appreciate the saying that nobody knows just where lightning is going to strike. My friend Owen got way back in the rear of the room, thinking he would not be called upon there. I managed to get an invitation to sit beside the president as assistant and thought I would be safe there, but there is no escaping. I am a good deal like the tramp who was making his way through Pittsburg and stopped at a house and asked if the good woman of the house had a cord of wood she would like to have him saw up. She told him no, they did not burn wood. "Well," he asked, "can I carry your coal in for you and make myself useful in some way?" "No," she said, "there is nothing for you to do in that line; we do not use coal here." He was nonplused for a moment, then he asked, "What do you burn here?" She said, "We burn gas." "Well," he said, "can I turn on the gas for you?" (Laughter). I suppose our friend, the president, has called on me to turn on the gas.

I will say I have had some experience during the forty years or better that I have lived in Minnesota in raising fruit. The first thing I did was to plant some apple trees, for which I sent way back to the old Granite State, and since then I have kept dabbling in fruit of different kinds, and now I have got a little orchard of five hundred trees that are all looking well, and some of them have borne in the past two years, and I have great hopes; and I want to say that my success has been in a great measure, if not altogether, owing to this very society. Now, if we can have somebody to stir us up a little and give us a punch under the fifth rib, it will do us good, otherwise we are apt to go to sleep and let things take their own way; but every time I step into a meeting like this I say to myself, I will take a little more pains with those apple trees, I will give some of them better care, I will get some of those better kinds, and I will throw out some of those I have already condemned myself when I see them condemned by others. I condemned the Tetofsky; I tried it a great many times, and every time I touched it I dropped it like a hot potato. I want nothing to do with the Tetofsky and the Hyslop, while the Ben Davis is a close third.

The members of this society meet here for a purpose, and that purpose, as near as I can find out, is to do good to their communi-

ties and to do good to the state in general. It is not a money making society, and when we come together here to talk these matters over, it is really to try to find out some better ideas of doing these things than we have already learned. We can raise wheat, and we are finding out that Minnesota is a great corn state. There is no trouble in growing everything that is a necessary of life, but we have in the past a great many times, even the best of us, had our doubts, like Mr. Smith, about our ability to raise apples in Minnesota. Now that we can have fruit, can have shade trees, can have some of the luxuries of life to make it a little sweeter, and have something to make home a little more pleasant and make life a little better worth living than when we first came here to our broad prairies, we feel that we have made no mistake. But, my brothers of this society, I will say there is no state, in my opinion, and I have traveled in most all of them, I have traveled in over forty of them, there is not one among them all that I would be willing to exchange for Minnesota today. (Applause). It has more resources and a greater variety of resources than any other state in the Union. We have one or two states right alongside of us that enjoy the same conditions, but you get away from this state and get out on those great barren plains, and then go through the south and find those immense forests of pitch pine, the soil nothing but sand, and then go through Florida and find it worse, and then along the eastern coast, along the Carolinas and find nothing but marsh and swamp, then on through Virginia and see their worn out soil, then up through New England and find little patches here and there, from which farmers are endeavoring to get a living, a little patch of a quarter or half acre, which it takes two men to cultivate, one to lead the horse and the other to hold the cultivator, and every half minute it will catch against a rock, and before going a rod another catch, and about the hundredth time they get caught they break the point of the plow and have to stop to go to the blacksmith shop to get it repaired before they can do any more work—and that is the way they are doing business today.

Minnesota has got the three great requisites of civilization, she has got them in great abundance, and the three things are a good soil, a soil that will yield everything that is necessary for man's comfort, an abundance of building material, and the third is plenty of iron. These three are absolute essentials of civilization. Take away any one of them and civilization is gone. Just as soon as we take away the valuable soil, take away from the farmer his scythe, his cultivator, his harrow, his ax and all his tools made of iron and steel, he is reduced again to the level of the savage. Take away from the carpenter his square, his hammer, his saw, take away all the tools he is using, and we go back to the condition of the Indian again. Minnesota has all these in the greatest abundance, and there is no state in the Union that can equal her. Now, besides these things necessary for life, comfortable life, and necessary to civilization, necessary to education, culture and refinement, we are going to have all those things that you and I, members of this horticultural society, have been working for, lo, these many years.

I remember how, many years ago, when the Wealthy apple was first advertised, I sent to the owner for a few scions, and he wrote me it was the best and hardiest apple Minnesota ever had. The Wealthy has held its own well, but we have hundreds of others that promise well, and we are going to have just as good apples as they raise anywhere in this world. The apples of Minnesota are better than those raised anywhere else, and the grapes are better than any other grapes in the country. Just look at our Delaware grapes —they are better than any others raised in the world.

Everything that we have looked forward to and hoped that it would come to pass in the distant future, we now see is right upon us. The first thing we hear in the east is that the winters are too cold and too long. Why, who ever heard of suffering much from cold winters? Those who suffer from cold are those who live in New England, and shiver when you talk to them about the ice palace; and I tell them it was sixteen below, and if we had no thermometer we should not imagine it was ten above. We have about twenty days each winter of cold weather, and those are the ones they remember, and those are the ones that give Minnesota her reputation for cold weather, but on the whole they are much more delightful than the winters in any other place. I never froze any part of my person in a Minnesota winter. I never suffered so much with the cold as I did in Louisiana and Florida, and the coldest time I ever had was in April when I suffered very much. The snow was melting, and I rode across the prairie in a sort of a hack; the sides were covered, but the ends were open, and I was going towards the northwest, and the wind sucked through that hack like water through the tail of a mill. The first half of the journey I was afraid I should die before I got to my destination, and the last half I was afraid I should not die before I got there. (Laughter). You cannot tell anything about it by looking at the thermometer. A man feels the best when he feels the best, and he feels the best in Minnesota in the winter time. Then it is we feel like jumping over the moon; then it is the blood goes tingling through our veins; then it is we are alive with health from the crowns of our heads to the soles of our feet. Take it altogether we have reason to thank God and take courage that our lines have fallen in such pleasant places, and everything is coming out according to the hope and faith we have long cherished. (Applause).

TIN CAN IRRIGATION IN GARDENS.—Owing to the scalding of the plants or the baking of the ground, surface application of water during the hot, dry season is often injurious rather than beneficial. By thoroughly saturating the subsoil, leaving the dry surface to act as a mulch, the plants gets the full benefit of all water applied, without harm. This can be done by taking old tin cans and perforating their sides near the bottom in a number of places, setting one in the ground a few inches from the hill to be watered. Fill with water, and the roots of the plants will do the rest.

THE SAN JOSE SCALE IN MINNESOTA.

PROF. OTTO LUGGER, STATE ENTOMOLOGIST, ST. ANTHONY PARK.

At this late date it is, perhaps, not even necessary to describe this insect, as so much has already been written about it in the various horticultural papers, the numerous bulletins of the experiment stations and other public documents. Until quite recently we only feared that this scale might find its way to our state, and, if introduced, it was believed it would soon perish. Such ideas were, however, erroneous ones, and the scale has already entered our state and, what is worse, is prospering at the present time, thus disposing of the belief that it could not exist here.

It seems that this scale was first noticed in 1873 at San José, California, which fact gave it the name under which it is now so well known. It spread rapidly until 1880, when Prof. Comstock discovered and collected it in Santa Clara County, and described it in the Annual Agricultural Report for that year as *Aspidiotus perniciosus*. He selected this specific name because he found it the most pernicious scale-insect known at that time; nor could a better name be proposed at this date, as it is by all means the worst insect

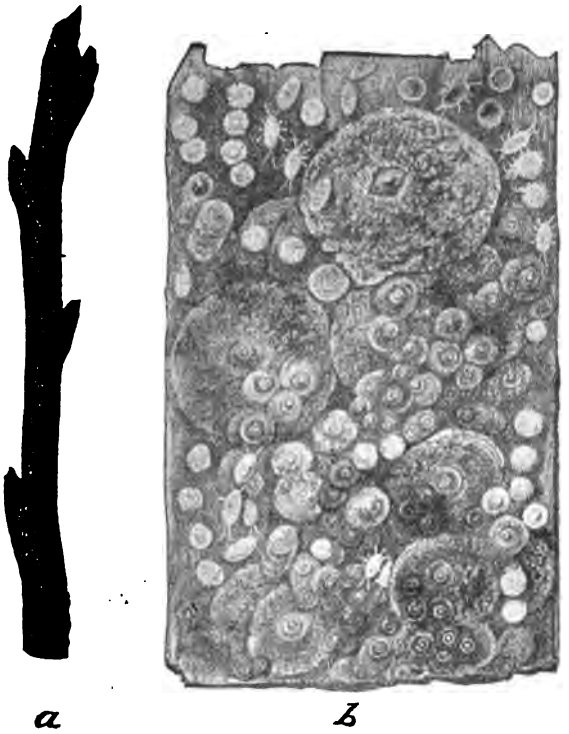


FIG. 1.—a, Infested twig, natural size; b, bark as it appears under a hand lens, showing scales in various stages of development, and young larvæ. (From Div. Ent., U. S. Dept. Agriculture).

which ever threatened our orchards. In 1892 the insect was discovered in the vicinity of Las Cruces, N. M., upon apple, pear, peach, quince and rose. In 1893 specimens were found at Charlottsville, Va. Soon afterwards it was discovered in many orchards in Fla., Md., N. J., N. Y. and Ohio, and in many other states. In November, 1895, it was reported in twenty states, and at the present time it is doubtful whether there is a single state in the Union that is not more or less infested in some orchards, while some of them are fairly alive with these insects.

The following description of the insect is taken from a paper published by the Division of Entomology:

The San José scale belongs to the same group of scale-insects, the *Armored Scales,* to which the common and well known oyster-shell barklouse of the apple belongs. It differs from this species and, in fact, from all other eastern species found upon deciduous fruit trees in that the scale is perfectly round or, at most, very slightly elongated or irregular. It is flat, pressed close to the bark, resembles the bark of the twig in color and when fully grown is about one-eighth of an inch in diameter. At or near the middle of each scale is a small, round, slightly elongated black point—or this point may sometimes appear yellowish. Young and full-grown scale are shown in the illustration. (Fig. 1*b*).

When occurring upon the bark of the twigs or leaves and in large numbers, the scales lie close to each other, frequently overlapping, and are at such times difficult to distinguish without a magnifying glass. The general appearance which they present is a grayish, very slightly roughened scurfy deposit. (Fig. 1*a*). The natural rich reddish color of the limbs of the peach and apple is quite obscured when these trees are thickly infested, and they have then every appearance of being coated with lime or ashes. When the scales are crushed, by scraping a yellowish, oily liquid will appear, resulting from the crushing of the soft, yellow insects beneath the scales,and this will at once indicate to one who is not familiar with their appearance the existence of healthy living scales on the trees.

They are easily scraped off with the finger nail, and the bark beneath them will be seen to be darker in color. The natural color of the bark is somewhat changed, as will be seen by comparing the places from which the scales have been removed with the spots upon which the scales do not occur. The outlines of the removed scales will be noticed upon the bark, and the circumference is frequently changed in color, becoming somewhat purplish. Where the scales do not occur so thickly, they are more perceptible, and upon young, reddish twigs the contrast is quite noticeable, as the scales there appear a light gray. The younger and smaller scales are darker in color than the older and larger ones, and sometimes appear quite black, while the still younger ones are yellowish.

During the winter the insect is to be found in the half-grown or nearly full grown condition. The young begin to hatch and to crawl from under the female scales shortly after the trees leaf out, and from this time through the summer there is a constant succession of generations.

The young louse is an active, crawling creature, very minute and yellowish in color. (Fig. 2*a*). The young spread out upon the new

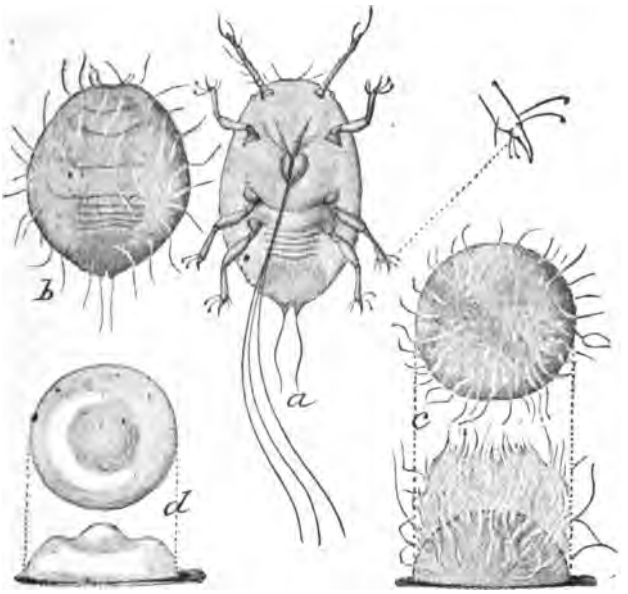


FIG. 2.—Young larvæ, and development of scale; *a*, ventral view of larvæ, showing sucking beak with the bristles separated; *b*, dorsal view of same, somewhat contracted, with first waxy filaments appearing; *c*, dorsal and lateral views of same still more contracted, illustrating farther development of wax secretion; *d*, later stage of the young scale—all greatly enlarged. (From Ent. U. S. Dept. Agriculture).

growth of the tree, settle down, and each begins to secrete a scale, as shown in fig. 2. During its traveling stage it possesses the characters shown in the illustrations. The male is an active, two-winged insect, shown in figure 3. The full-grown female loses her legs

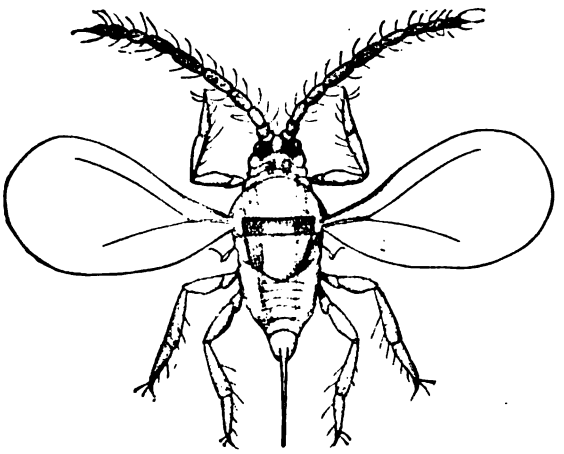


FIG. 3.—Male of the San José Scale. (From Div. Ent. U. S. Dept. Agriculture.

and antennæ, and bears a very slight resemblance to a living insect. It is shown in fig. 4*a*. Fig. 4*b*, shows the spinnerets.

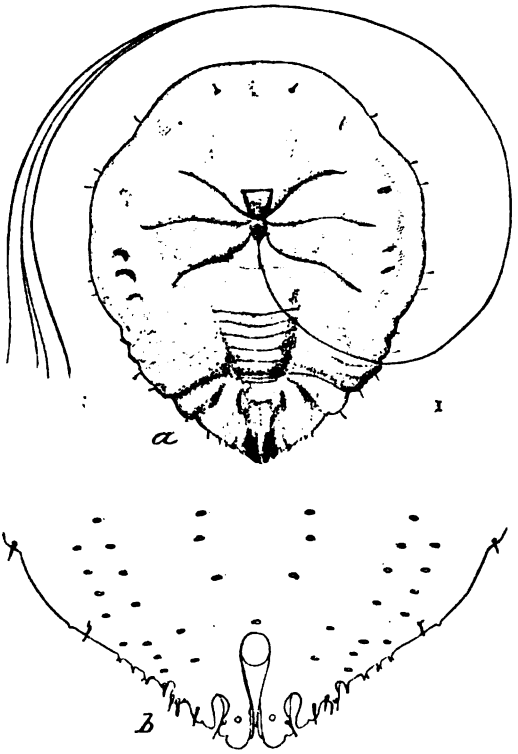


FIG. 4.—*a*, Adult female, ventral view; *b*, spinnerets of the same. (From Div. Ent., U. S. Dept. Agriculture.)

The insect affects not only the young twigs and limbs, but is also found upon the leaves and upon the fruit. When abundant the fruit is destroyed. One of the most characteristic points in the appearance of the insect upon the fruit is the purple discoloration around the edge of each scale. So far as we know this result is confined to this one scale insect. Upon the leaves the insects have a tendency to collect along the midrib on the upper side of the leaf, in one or more quite regular rows, and also to some extent along the side ribs. The infested leaves turn brown, but do not have a tendency to fall as a result of the damage.

How the insect spreads. This scale insect can be carried upon fruit sent to market. Large numbers are thus sent long distances, and almost invariably reach their destination in good health. But as most of such fruit is eaten in the cities or away from orchards, there is not so much danger on that account, and only where peelings of fruit are thrown about in a careless and filthy manner among growing bushes and trees can the young lice find a new home. These young lice are decidedly active for a brief time, two or three days at

most, and they crawl with considerable rapidity and great persistence, so that they might possible descend from one tree and crawl for a number of yards to another; but the spread in this manner is insignificant. Where trees are close together they may pass from the branches of one to the branches of another. They rarely crawl long in one direction, however, but rather move rapidly around, irregularly and at random. Usually they do not go farther than is necessary to find a good place to settle and at once begin to form a scale. This very interesting process is shown in figure 2. As soon as the young louse has inserted its beak into the plant, and has begun to feed, a change comes over it, and within a few hours it is entirely covered with a fine, white, waxy film. This turns to yellow and then gray or even black, and the creature is a fixture, absolutely incapable thereafter of shifting its position under any possible circumstances. Strong winds may carry the young bodily from one tree to another, but the principle method of spread is by means of other insects which are winged and by birds. The active young lice will soon crawl upon any small winged insect, particularly if the latter is of a dark color, and they may be carried by it to a considerable distance. They also crawl upon the feet of birds which visit the trees and may thus be carried for miles. They are often found upon ants, and ants, as every one knows,are great travellers. The difficulty in moving from one place to another, and the dependence upon external agency for their distribution, will account for the fact that trees here and there in an orchard newly set out may be very badly infested, while not a trace will be seen on the trees on either side. Few birds or insects visit a young orchard that is at all well kept, and the distance between the trees, especially if the land is cultivated, is altogether too great to be covered by the young lice, even did they know enough to make a bee line for the nearest point. The result is that everything fixes upon the tree upon which it was hatched, killing it more rapidly than would otherwise be the case, but at all events confining and preventing its spread to points not before infested. This also explains why nursery stock is so evenly troubled: here the trees are grown just as closely together as is possible in rows, and there is no hindrance to crawling from one to the other.

As the insects must feed for a time in the spring before attaining their full growth, it follows that only such as are fixed to the tree itself have any chance of reproducing their kind. Those that fix to the leaves fall with them, and as these dry or decay the insect dies for want of food before attaining maturity. Those on the fruit are removed when this is ripe. We have thus to consider only the wood, free of all leaves and fruit, when attempting the destruction of the insect.

All our deciduous fruit trees and many forest trees are attacked by this insect in varying degrees. Smaller plants, like currants, gooseberries, raspberries, roses, etc., are also to its taste. In fact, nearly all bushes and trees will support it.

Like most other insects this scale insect has a number of parasites that kill some of them. Large numbers are also eaten by such insects

as the lady-bugs, and chiefly the smaller kinds do not despise such a little creature. They are, all combined, but a slight check to the

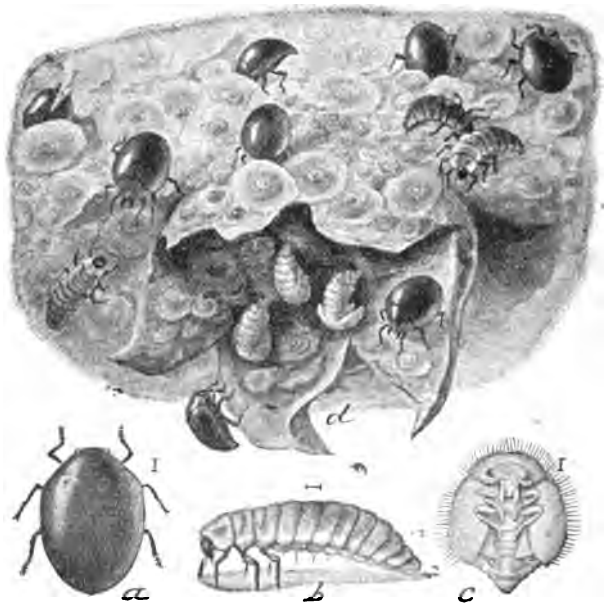


FIG. 5.—*a*, *b*, *c*, Different stages of a minute black lady-bug; *d*, larvae and adult of the same in the act of devouring the scale insect. (From Div. Ent. U. S. Dept. Agriculture.)

increase of an insect that is so prolific and has so many generations in the course of a single summer. The figures given of the number of offspring in one season are almost past belief, but they are based upon actual observation.

Remedies.—A large number of remedies have been tried, with more or less good results. As the writer has no experience with them as regards the scale, and as so much has been written about the insect and the remedies in pamphlets that are accessible to all interested in this matter, it is not necessary to mention them at this time, especially as the insect can still be prevented to spread in our state. By all means the best, and in the end the cheapest way, is to destroy the trees that harbor such insect. Quite recently Profs. Smith and Webster have sent out circulars in which they state that pure kerosene oil, sprayed upon the bare trees during a day with sufficient wind to evaporate this oil very rapidly, would kill the insects without injury to the trees. Perhaps it will, and it would be a sort of patriotic action on the part of some of you to sacrifice a few trees, or rather to run the risk of doing so to try the remedy. Soaking the bark of an infested tree with such oil and burning it is also recommended; I suppose on the principle that burning a house will kill all bedbugs.

Recommendations.—1. Every orchard that has been set out within the last six years should be thoroughly examined to ascertain whether or not the San Josè scale is present.

2. If the insect is found to be confined to a few trees these had better be taken out and destroyed, unless the infection is so slight that all scales can actually be removed with a stiff brush. No half way measures will suffice.

3. No fruit grower should admit a single young fruit tree or a single cutting or a single bud from a distance into his orchard without first carefully examining it and satisfying himself absolutely that it does not carry a single specimen of this scale.

4. Buy trees only from responsible nurserymen, best from your own state, and only when you feel quite certain that they sell plants not infested by this scale.

5. Infested stock is most likely to come from eastern or southern states where the scale abounds.

6. Avoid nurserymen that do not grow themselves the plants they sell. The scales that found their way into Minnesota were all bought outside the state, not from nurserymen but from dealers in nursery stock.

7. Have quarantine regulations established by the state.

As showing the existence of the San Jose scale in Minnesota the following letter from Mr. Thos. Miller, of Heron Lake, Minn., was read by the secretary:

Mr. Dewain Cook, HERON LAKE, MINN., Nov. 7th 1897.

MY DEAR SIR:—Your letter of the 6th inst. at hand. It is true that the "San Josè scale" was found here in my orchard by Prof. Otto Lugger, State Entomologist. I will relate how it came to be discovered as briefly as possible.

In 1893 I entertained the idea that nearly all the hardy fruits could be grown in Minnesota, especially apples and plums. My brother and I had about fifty acres that were suitable for fruit culture, and we proposed to plant it all with fruit, mostly apples and native plums. Before planting such a large tract, it was necessary to experiment with the different varieties to see which were hardiest and thrifty. Since '93 our orcharding has been mostly experimental, embracing some twenty six varieties of apples, eleven varieties of plums, seven varieties of pears, seven varieties of cherries, with strawberries, blackberries, etc. We have planted trees from five nurseries, your own included. Last spring among others planted were six Wolf River apple trees. I planted them just as I had done all my others. Two failed to make any start, another lingered along for a month and then died, leaving three. These were the first apples I ever failed to make grow the first year. Sometime during the summer I had been reading some notes on the "San Josè scale," and as I have had a taste for entomology since I was very young it proved interesting reading. About the first of August I was walking through the orchard looking out for aphis on the plum trees. In my walk I passed the Wolf River apples, and on one I thought the bark looked funny just at the crotch. I went up to it and found it covered with grayish white spots about the size of a pin head or smaller. By rubbing with the fingers the bark had a greasy feel, and the whitish spots rubbed off, leaving the bark its natural color. I saw it was a parasitic disease, and from what I had read knew it was the dreaded San Josè scale. As soon as I was reasonably sure in my own mind it was the scale. I looked all my other trees over but could not locate any more. The two remaining Wolf River apples that came in the same shipment, I examined carefully but could find no scale. The infested tree I kept watch on daily. The scale increased until the bark seemed covered with a whitish mould, and on October 1st I notified Prof S. B. Green and at his request sent some twigs for inspection, which Prof. Otto Lugger pronounced "San Josè scale." On October 25th, Prof. Lugger visited the orchard, saw the infected tree and pronounced it the San Josè Scale, sure. The other trees were examined, but no more were found. These are the facts in the case.

I was not aware a petition went from here to the *last* legislature against the San Josè scale bill. Would like the name of the party who sent it.

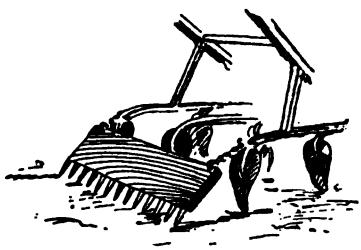
Yours truly,
THOS. MILLER.

BEST DECIDUOUS TREES FOR SHELTER BELTS IN SOUTHERN MINNESOTA.

F. W. KIMBALL, AUSTIN.

The question of what is the best deciduous tree for shelter belts for southern Minnesota is, I suppose, asked to invite discussion as to what is best to set out where one is about to select a new building site. Were I about to start on the prairie, I would if confined to deciduous trees set out on the outer lines, to the north and west of about a five acre lot, several rows of willow cuttings, then next to them on the inside I would devote a space to green ash and inside of them would set several rows of box elders and would thus form a dense windbreak that would to a great extent reduce the rigors of winter save snow from drifting about the buildings and pretty thoroughly protect the stock. The willows, if the rows are not set too close together, can in a few years be topped and the summer wood, at least, for a good sized family, can be grown indefinitely by cutting a portion each year. It can be gone over every six to eight years, yielding a good crop of wood. Immediately after cutting, the stump sends up a forest of sprouts, which by the succeeding winter will stop the snow effectually. The ash and the box elder I would set in rows about four feet apart and about the same distance apart in the row. As soon as they commence to crowd, I would thin them out to about eight by eight feet, leaving them in the quincunx order. The ash and elder would furnish a good deal of good winter firewood in this thinning process, and I do not think there are any other two varieties that will stand as severe drouth or as much tramping of stock, if the owner is so indifferent or careless as to let stock run in it. After the elder has obtained a growth of ten to twelve feet, I do not think stock would do much harm by running in it. While stock will trim ash to some extent, I have never noticed them disturb the box elder except to rub against it, and it seems able to stand a good deal of abuse.

A FOLLOWER FOR THE CULTIVATOR.—Cultivating the growing crops is highly conducive to growth, but in times of dry weather there is an enormous evaporation from the soil that has just been stirred by the broad teeth of a cultivator, the land being left in loose ridges. Some advocate hanging a board behind to drag the surface of the earth down smooth. This has a tendency to pack the surface which is not desirable. Hang the board as shown in the cut and insert in the lower edge a row of forty-penny wire nails, removing the heads. This will leave the surface smooth and level but loose, so that the air and sunshine can enter, while at night the moisture-laden air will enter, the moisture will condense as it is cooled by the ground, and so will remain in the soil.



SHELTER BELTS IN THE RED RIVER VALLEY.

D. R. McGINNIS, ST. PAUL.

I am aware that possibly the advocacy of thick planting will meet with criticism, but I have all my life been especially impressed with the fact that trees are so dependent on one another that close planting is an absolute essential. I have noticed that in the forest where young trees are close together they are most flourishing. There is a vital reason for this. The wind and the direct rays of the sun are the most effective means of stealing the moisture from the ground. I will show you another reason. You will find that many varieties of trees, where they will not succeed at all in the open ground if planted far apart, in the forest will grow and do well. It is a very safe thing to say that fruit trees are too close together and forest trees too far apart. The reason of it is this: When we plant fruit trees we plant them to get a low spreading body, and in fruit trees sunshine and wind are favorable to the protection of trees and the production of fruit. Take the hickory nut trees in central Illinois: those on the edge of the forest do not amount to much, but as soon as you get in the center of the forest there are solid bodies of magnificent timber. The object is to get a well formed trunk. We are not growing the trees for fruit, and I am positive that a great deal of the difficulty that we have noticed in tree claims on the prairies arises primarily from the fact that the trees are planted too far apart. The average tree claim does not succeed because, it is likely, the ground is not cultivated enough. If you plant trees close together you cannot cultivate them, and if the trees grow close together there is no need of cultivating them. I do not mean to advocate the close planting of trees in such a manner that they will touch each other, but give each tree the proper amount of sun and light to afford it a good growth, but not space enough around the trees for the sun and wind to steal the moisture away.

If you will study this question of what the sun and wind will steal from the ground, you will find it is perfectly marvelous. The temperature at eighty degrees and the wind at twenty miles an hour will take away water six times as fast from the ground as it will with the temperature at seventy-two degrees and the wind five miles an hour. The great trouble is the evaporation. The rain fall in the Yukon valley is nine inches. We have vast forests in Alaska that are very flourishing. With a rainfall of nine inches in southern Texas, it is a positive desert. Take a grove of thickly planted trees; the evaporation is very slow, and in a dry time the moisture is conserved. On open ground if it rains in a dry time, the ground will soon be perfectly dry, but where there are trees it is a week or ten days before the ground dries out.

Mr. O. Gibbs, Jr: I wish to endorse what Mr. McGinnis says in regard to close planting of forest trees. I have been a successful tree planter in South Dakota, and I have never yet seen one grove that was planted in that way that was not a success. I am satisfied from observation that the first aim of the tree planter is to go into his plantation with a horse cultivator and get over the ground as

quickly as possible, otherwise if he wants to make a success of his plantation he has got to work long years to do it. As soon as the the shade gets over the ground, the trees will take care of themselves, and the grass will not grow. Three or four feet apart for a forestry plantation would be about the distance I should plant in a dry climate. I have noticed this: in some young plantations there are some of the trees that are a great deal stronger than others; you can see the process of nature by which they thin themselves, and no matter how thick they are they will take care of themselves.

Mr. Clarence Wedge: Mr. President, I feel like endorsing what Mr. McGinnis has said about close planting. I want to add one thing which I think he omitted to state, that after a tree is large enough to shade the ground, or really before that, it should be provided with some sort of underbrush, to form a sort of forest floor, which seems to be one of the most important things in grove planting, something that will hold the leaves in place and make a natural forest floor that is cool and moist. I think for this purpose hazel brush might be used, and the red raspberry. I have seen that flourish in groves, even of cottonwood. While I am up I will say that it is frequently argued against this close planting that the cottonwood is a failure where planted close, but where planted in rows the cottonwood is a success. I think we ought to make a difference between the trees as to which of two classes trees belong. All such trees as the willow, cottonwood, soft maple, box elder and, indeed, all the poplar family, belong to that class, will not endure very close planting, but the ash and the elm and all of our better and most durable trees will endure closer planting when young, and they will naturally thin themselves without the axe.

The President: I have met with a good deal of disappointment along this line, and perhaps some of the friends can advise me what to do. One of the most interesting features of my home is a grove, near the house, which was planted by Dr. Jewell, who obtained the trees of Mr. Elliot. The trees were planted in natural order, just as you would find them in the forest, in an irregular manner. The grove has been a beautiful feature of our home for many years, but now it is dying out. The tops of a good many of the trees are dead, and some of the trees have been killed altogether. I have cut out a good many, and I will have to cut more out, I suppose. A part of the ground is level, but a little of it, which is somewhat gravelly slopes off to the northeast, so it is drained off pretty easily; and the soil is a loam, a sandy loam, a good rich soil with a clay subsoil; it is our strongest soil. I thought the trees on that ground would stand forever, but I am meeting with this experience. I do not think that there is a great deal of water that gets into the ground, at least a great deal of it runs off. I thought this fall I would not rake up the leaves in that grove, and I left them. They make a splendid covering for roses, and our gardeners like to rake them up for that purpose. Some of the trees are hard maple, and the leaves are very nice for that purpose, but this fall I stopped the men and told them I wanted the leaves to remain there. I think I planted the trees too close. The nearest the trees were

together was about twelve feet, and the farthest apart about eighteen feet. Of course, they have been thinned out a good deal, so that now the trees are about thirty feet apart. If anyone has had an experience of a similar nature, or can point out the mistake or mistakes I made, or has any advice to give as to the treatment of that grove, I would be very glad to receive it.

Mr. McGinnis: I do not know that I can solve the question. I looked at that grove with a great deal of interest during a visit I made there, but I made up my mind the grove was choked to death because he had permitted blue grass to grow around the trees, and, under the exceptional circumstances of the year 1894, millions of Minnesota forest trees were killed existing under the most favorable conditions. The hard maple is a very delicate tree. The natural habitat of the tree is on deep muck soil in swales; that is the natural soil of the hard maple. Mr. Underwood's hard maples are planted on a hill, and, while it is a nice thing to have blue grass, it is a violent enemy of trees. Blue grass is the natural enemy of trees. If the ground is a sandy subsoil, the hard maples would die anywhere. If you go through the forests of Minnesota, you will find that the tops of all hard maples that grow on high ground are dead. There was one variety of oak, the red, that was exterminated in 1894. There was a forest of red oak about seventy-five miles over the line in Wisconsin, about forty by twenty miles; it was the finest red oak forest in the United States. That forest died out entirely. Every tree died in the summer of 1894. In the summer of 1894 the temerature was largely in excess of what it should have been, and there was a low degree of humidity, with strong, hot winds, and it accomplished the death of thousands of hard maple trees in Minnesota and throughout the northwest.

Mr. Gibbs: How many years have you been raking out those leaves, Mr. Underwood?

The President: We plowed and cultivated the trees thoroughly until they shaded the ground, and then we let the grass grow. I do not know how many years the leaves have been raked up, but every year since the trees have been of any size.

Mr. Gibbs: You had better let the leaves alone if you want those trees to grow.

The President: So far as hard maples growing on high ground is concerned, we get a great deal of hard maple wood from the bluffs in Wisconsin, and the hard maple grows naturally on the bluffs.

Mr. McGinnis: The rainfall is heavier north of you the higher up you go, and there are some splendid hardwood forests north of you.

Mr. T. T. Smith: I saved a natural grove of red oak about my house, and I have been thinning it out for fifteen years, but for the last three or four years they have been dying out. Some of them are very large oaks, and they had plenty of room, as I thought, and were not crowded at all, but two years ago quite a number of them died. I have put no fertilizing material on them.

The President: I think it is simply a lack of moisture. The ground is fertile, but the red oak is killed out, as well as the elm and the Norway spruce—the elm is good for nothing. There are a

good many elms in that grove the tops of which are half dead. Perhaps I will plant the grove over to bur oak, and when the other trees die out I will have a grove.

Mr. C. L. Smith: If I were to answer your question I would say the trees are planted too far apart, the ground kept too open and the grass allowed to grow. Some twenty-four miles west of where Mr. Wedge lives, twenty-nine years ago, I planted a mixed grove of about seven acres, consisting of soft maple, ash, box elder, cottonwood and willow; I planted them very thick; I think none of them were more than six feet apart in the rows. The rows were six feet apart, and the trees two feet apart in the row. The man who now owns the farm has been cutting timber from that grove for the last fifteen years. I was there two years ago and looked the grove over carefully, and there were no dead trees there, when there were lots of dead trees in the groves west of Minneapolis. They are two feet in diameter; I did not see one with a dead top. Mr. Wedge spoke of underbrush being a good thing to put in such a grove. We put in black raspberries, and the family has all the black raspberries they want to use, and they have never planted any anywhere else. The weeds and brush grow in there and keep the ground quite shaded over, and there is never any grass growing there. I doubt if it is possible to grow any kind of timber in groves if you get the trees wide enough apart so the grass will grow.

Mr. Wedge: There is a grove of bur oaks at Albert Lea that stand about fifty feet apart, and the trees are about thirty feet high; they are surrounded with blue grass—the ground is covered with blue grass—and the leaves are religiously raked up every fall, and those trees are showing signs of giving out and dying, and some of them have died. The older trees are nearly all dying. Those are young ones, and they will hardly reach their full prime and vigor.

Mr. Elliot: What is the soil?

Prof. Robertson: It is a gravelly subsoil. If those same trees had been in a grove with natural conditions I have not the least doubt they would have done well. Their ancestors lived to ten times their age.

Mr. T. T. Smith: May I ask a question in regard to oak trees? Last fall in certain sections of Dakota county the foliage of the bur oak was eaten off by a worm. Will those trees be injured? I went through the forest and saw hundreds of them, and I do not think I saw a bur oak that had any leaves on.

Mr. C. L. Smith: Seven years ago when they ate them there was no apparent injury afterwards, and I was examining them a week ago, I was examining the branches and cut some off, and they were as full of sap as ever. Seven years ago they ate the leaves off clean, and the next spring the leaves came out just the same; and nine years ago we had a freeze on the 28th of May, and the bur oak came out all right.

MY HOME IN A VINEYARD.

MRS. ISABELLA BARTON, EXCELSIOR.

I have been asked to write of my home in a vineyard. It seems to me that the idea of a home in the vineyard is a very good one, for one must spend most of their time there throughout the season. I shall make no effort to instruct any of you old grape growers and will merely talk of my own home.

I have been accustomed all my life to seeing the grapes grow, for every one in our country had his own grape vine and peach tree, but the conditions here are so different I had everything to learn over. I can think of nothing more discouraging than the outlook in a vineyard in springtime just after the vines are taken up. Everything seems dead; one does not feel like making much of a stay there at that time. But what a transformation in the next two or three weeks! How the buds grow! I have sometimes thought the grape vine must come next in growth to that famous gourd vine we have all heard tell of. How fast the canes grow! Those that are not long enough to tie today are away above the average tomorrow.

I commence tieing as soon as the canes reach the second wire; if left too long a hard wind whips them off badly, and I find it difficult to keep up with them. In thinning and pruning I follow the law of the survival of the fittest. I try to keep laterals pinched off; if left to grow, the whole business soon becomes bewildering.

I find Delaware, Moore's Early and Agawam the most profitable grapes to grow, the two first as table grapes, the Agawam for jelly. There is a peculiar flavor about Agawam that makes it particularly nice for jelly. I find the five pound basket most useful for market and am careful to pack good grapes only.

There is a new grape, called the Campbell's Early, that is being brought out in the east. We have some of the fruit here. I think for a new variety it is certainly something very nice, and something it would be well for us to keep watch of.

Mr. Jewett: Is there any one here who has any experience in grafting grapes?

Sec'y Latham: I have never done much grafting of the grape vine, but I think it would be a desirable process. The grafting is done below the surface of the ground. It is perfectly practicable; I have grafted three or four vines, but not to amount to anything.

Mr. Schiller: I would like to know whether fall or spring pruning would be best. Where I came from they are all fruit growers, and there are nice vineyards there, and all their pruning is done in the fall. They grow the grapes for the money that is in them, and they claim fall pruning is the best. I had a Frenchman working for me, and he told me never to prune in the spring.

Mr. Van Houten, (Iowa): I was one of those who believed that spring pruning and bleeding of the vine would be detrimental to the crop. Once in a while after pruning, spring would come so early that there would be considerable bleeding. In talking with some of our most successful grape growers, I found that they were pruning in the spring, and if they bled they let them bleed, and in some of those vineyards where the vines did bleed excessively they remained alive and healthy. I think a great deal of the question of the bleeding of grape vines is a question of prejudice; it does not injure the vines in any way. I prefer fall pruning, however. I only speak of the prejudice against spring pruning which is common. I would not cover the vines, but cover the cut ends. If I did not do that I would do my pruning in the spring, but my preference would be to lay my vines down and have the ends of the vines covered to prevent evaporation. Our growers are discussing the question of rooting out their grapes, as it does not pay them to compete with New York growers.

Mr. Elliot: How can they afford to grow grapes and ship them at one and two cents per pound?

Mr. Van Houten, (Iowa): They have a good climate, they have cheap labor, they are in the business, and they are going to stay in it, and you want to hesitate about going in such competition.

Mr. Lord: I had a long talk last fall with a grower from Chattauqua county, New York. He had one hundred tons for sale. He sold them at one and one half cents per pound, and he said he would have to quit if he could not get better prices.

Mr. Dartt: I think, Mr. Chairman, the point is they can sell them for no more. Now, a year ago I shipped a carload of apples to cold storage in Minneapolis, and I paid the storage on them and paid the other expenses, and they cost me about a dollar per barrel, and as they were not keeping very well I took them out and sold them, and I got seventy cents per barrel. How could I afford to get the apples in the Minneapolis market at seventy cents per barrel? But I did it, and I speak of it because this is the way they do with grapes; they try the experiment of shipping them west even if they do sustain a loss, just as we have to sell the Duchess apples, because it is a question of selling them at some price or letting them rot on the ground. I let a good many of mine rot on the ground; that was the most profitable business I did.

SUCCESSION IN VEGETABLE PLANTING.

As the result of some experiments in the home garden by Prof. Thos. Shaw, of the University Farm, at St. Anthony Park, the following successions in garden crops proved eminently suitable.

1. Seed onions, radishes and turnips or ruta-bagas. The onion seed was first sown. The radish seed was then put in rows equally distant in every part from the rows containing the onion seed; that is to say, there was one row of radishes between every two rows of onions. As soon as the radishes were fit for use they would, of course, be removed. Turnips or ruta-bagas were then made to follow the radishes, but not immediately, or the tops would over-shadowed the onions before the latter had sufficiently matured. It would be possible to get two crops of radishes and then a crop of turnips in the same rows.

2. Onions from sets, cauliflowers and cabbage. The cauliflower plants were put in every second row between the onions, and the plants were put two feet distant in the line of the row. The onions were used on the table in the green form. Care was taken to pull the plants that grew around the cauliflowers first, and in due time cabbages were planted in the centre of the squares between the cauliflower plants.

3. Lettuce or radishes, potatoes and citrons. The first crop occupied the ground except where the potato rows were to grow. When the lettuce was all removed, citron seeds were then planted. The potatoes were of an early variety, and when removed the ground was left in an excellent condition for the citron vines to run over it and mature a crop.

4. Dwarf peas, corn and squashes or pumpkins. The peas matured before the corn over-shadowed them. In the rows where the corn was to be planted, peas were not sown, but before the corn-planting season there was ample time to reap a crop of radishes, lettuce or spinach from the rows which were to produce corn. The pumpkins and squashes were planted in between the corn hills, and at the same time.

5. Onions from sets, cress or pepper grass, and beans. The onions were used on the table in the green form, and the beans were then planted. The onions were first removed where the bean hills were to be made, so that the beans had made considerable growth before the onions were all removed.

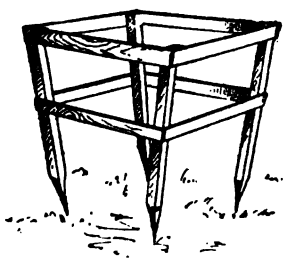
When crops are thus grown in succession, they must, of course, receive close attention. As soon as one crop has fulfilled its mission, it must be promptly removed and another one put in its place, and where plants are inclined to crowd they can oftentimes have the exuberant growth lopped off. Prompt attention to such details is necessary where the highest possible success is to be reached; but the needed attention is not labor to one who loves husbandry The pleasure of seeing the plants grow would go far to reward those who thus care for a garden.

CONVERTING THE RED RASPBERRY CROP INTO MONEY.

S. J. EVANS, LA CRESCENT.

This is a somewhat difficult subject to discuss this year—by using all my powers at converting I did not get much money. It puts me in mind of a preacher shouting and clapping his hands with all his might,and when he got through he could not see what he had gained except the development of his muscles. Well, this does not cover the subject. Perhaps, never again will we have to face such low prices for our fruit, prices ranging all the way from $1.75 to nothing per case. Many may wonder how that is. In he first place I sold for $1.75 per case at the stores (which has heretofore been my customary way of doing business, to get the best results)—speaking of this year's price for the first I took to market. As more come in the prices drop to $1.00 per case sometimes, very seldom. My best berries usually bring from $1.50 to $2.00 per case spot cash. Often I ship to dealers and private parties in small towns and thereby get better prices (that is when they are too cheap at home.) This year I let a commission man handle my fruit through the "Berry Grower's Association." He did handle it, too. The first shipment he made I received the handsome sum of 50 cents per case, (they were worth $1.50 at home) minus commission. So much for the "Berry Grower's Association." The second shipment I fared no better; after that he was a little more generous (except when I got nothing.) Commission men must live as well as I, though I do not like to be the one to help support them. One thing that puzzles me is how they can get 10 per cent out of nothing,as 10 per cent is their rule to charge; it seems sometimes as though I got the 10 per cent, and he the balance. If possible I will handle my own fruit after this. I am confident if I had done so this year I would have made much more. My old way of going to the stores is the safest plan for me and then shipping the surplus wherever I can find a market—even if it does look big to belong to a "Berry Grower's Association." Perhaps others do better by belonging to it; I cannot say. Every one must use his own judgment in disposing of his fruit. Circumstances might render it necessary to reverse my plans. My time is limited to five minutes, and my subject will not allow me to discuss the cost of producing a crop of red raspberries, which can be done for five cents per quart and a margin left. But I don't like to sell so cheap.

A GOOD TOMATO TRELLIS.—The sketch shows a trellis for tomatoes that completely "fills the bill." The double side pieces hold up both lower and upper branches, while the flaring form of the trellis, accommodates the spreading top. A dozen of such trellises, strongly made, will prove exceedingly satisfactory in the garden, and will last many years if carefully used. Do not wait till they are wanted next summer, but get a sufficient number of them ready when other work is not pressing, and store them in the barn or under a shed.



THE FIVE FLOWERS IN MY GARDEN THAT GIVE ME GREATEST PLEASURE.

MRS. GEO. H. PRESCOTT, ALBERT LEA.

My five favorite flowers? Such a question never before entered my mind, the five from so many! A hard problem indeed! In April the delicate blue and white crocuses peep out of their furry coats almost before the ground is thawed; surely nothing ever is so welcome and gives me so much pleasure as these tiny flowers, foretelling the bright spring days, followed by the sunny days of mid-summer. The sweet-scented California violets and starry Siberica come soon; they must not be slighted, nor the large baby-faced pansies, turning their bright eyes towards us, be passed. Next come the yellow and white narcissus, old-fashioned but still beautiful. They should be one of the five. The fragrant and heavily petaled hyacinth, in white, blue, pink and yellow—must we omit these? Near by are the tulip beds aglow with their bright cups held up in the sunshine—tulips, single and double, tulips red, white, pink and yellow, intermingled with the ragged, curly, twisted parrot tulips, all combining to make one solid bed of color. What can be more glorious than these? Then the roses begin to bloom. No more doubt and wondering now. Of course, roses are and always have been my first choice. Roses in all the colors known in the family; beautiful from the time they show the first line of color in the growing bud until the climax of beauty is reached in the full-bloomed flower; then falling, still leaving a sweet remembrance in the bright petals covering the dark earth beneath them.

Would you know which are my special favorite roses? They are Gen. Washington, Gen. Jacqueminot, Marshal P. Wilder, Paul Neyron, John Hopper, Coquette des Alps, pink and red La France, Earl of Dufferin and Madame Gabriel Luizet. What shall have second choice, the canterbury bell, white achilles, the royally purple perennial larkspur, the mass of silk poppies, double and single, or the long row of sweet peas, covering the wire fence in their multi-colored combinations, every color mixed and intermingled in one bewildering mass, a thing of beauty and a joy for many weeks? Yes, these last shall have second place. The ranunculus, in all its varied colors, deserves third, while the fourth belongs to lilies, candidum and rubrum. Double peonies, gladioli, Japanese iris, forget-me-nots and spireas are beautiful in a way, but are not particular favorites of mine, so I will give California violets number five, although the hardy carnation seems to deserve it quite as well.

PRUNING WITH THE THUMB.—We all know how we dislike to cut off large branches from fruit trees. It is plain to any thinking person that if the undesirable branches could be discovered when they were very small and prevented from becoming large, there would be no necessity for cutting off large ones. Now, this is just what we may do in many cases. By watching the young trees carefully from time to time as the little shoots are starting that will make the branches, we may rub off with the thumb those that we see are destined, if left on, to be such as we will not want. Any shoots starting towards the center of the tree, or in any undesirable direction, may thus be prevented from going any further.

NOTICE OF

Summer Meeting,

1898,

OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY.

The regular summer gathering of the society will be held as usual this year at the State Experiment Station, at St. Anthony Park, on Saturday, the 25th day of June. It is the purpose to set this date to accommodate the rose and strawberry growers in those parts of the state most accessible to the place of meeting, though the selection of dates this season has been influenced by the desire to convene in juxtaposition with the "American Out-Door Art Association," which meets in annual session June 22, 23 and 24. The work of that association is in close sympathy with that of our own, and it is hoped that many of our members may find it possible to attend their meeting here.

No special departure from the order of exercises of previous similar gatherings at this interesting place has been arranged, the usual general plan being very acceptable and hard to improve upon. The forenoon will be given up to a survey of the grounds and a study of the infinite array of experiments in all branches of agriculture being carried on there under the guidance of the professors attached to the station and their corps of assistants. There ought to be enough to be learned in such a tour of inspection to well repay the trouble incident to attendance upon the meeting. At all events, a two hour's tramp in the experiment fields will whet the appetite for the mid-day lunch, which, meantime, your "gude wife" will have been preparing in one of the spacious halls on the grounds. And do not forget to bring along a *well filled lunch basket* to help swell the general fund of good things. As for fruit, we hope to feast on the strawberries brought by our exhibitors, while the roses and bouquets will grace and adorn the tables.

Every one is welcome to this festive occasion. If not a member, $1.00 will make you such and give you all the publications of the society, and a voice in its deliberations. The society never was so strong and vigorous as today, and in the grand work before it you may well be proud to share.

After lunch the regular summer session of the society will be held. No formal program has been prepared for this occasion, but a number of practical horticulturists and friends of horticulture will

be found to occupy two hours time for the benefit and pleasure of those in attendance.

HOW TO REACH THE GROUNDS.

Visitors from Minneapolis should take the interurban electric car line and get off at Cromwell avenue, those from St. Paul should take the Hamline car and get off at Raymond avenue. Carriages will be at these points to carry visitors to the grounds at 9:30, 10:30 and 11:30 a. m. and at 1:30 p. m. As far as convenient, those attending are advised to drive over in their own conveyances. Take Como avenue from Minneapolis, and through Como Park from St. Paul. There are ample accommodations on the grounds for stabling and caring for as many teams as may come.

For further information address

J. M. UNDERWOOD, President, Lake City.

A. W. LATHAM, Secretary, 207 Kasota block, Minneapolis.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place by 12 M., to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the articles exhibited. The fruits and flowers exhibited must have been grown in Minnesota and must be correctly labelled.

No premiums will be awarded on unworthy articles.

FLOWERS.

(Six flowers of each variety.)

	1st prem.	2d prem.	3d prem.
Collection of cut roses	$3.00	$2.00	$1.00
Each named variety of cut roses	.50	.25	....
Bouquet of mixed garden flowers	$1.50	$1.00	.50

FRUIT.

(One quart of each variety.)

	1st prem.	2d prem.	3d prem.
Collection of strawberries	$4.00	$3.00	$2.00
Each named and catalogued variety of strawberries	.75	.50	.25
Seedling strawberry never having received a premium from this society	3.00	2.00	....
Each named and catalogued variety of currants	.75	.50	.25
Each named and catalogued variety of gooseberries	.75	.50	.25

Calendar for June.

PROF. S. B. GREEN, MINN. STATE EXP. STATION.

At this season of the year the most important matters in the garden and nursery are to cultivate thoroughly and keep off insects and fungous diseases from the new growth. The one keeps the roots in good condition and the other keeps the foliage vigorous, and both sets of organs must be vigorous in order to get the best results. It is far more important to cultivate well in June than at any other time in the year, since this is the period when the greatest growth is made.

It does not look now as though it would be necessary to irrigate this month, but it would be well for us all to bear in mind, if we have any opportunity to irrigate, that irrigation should be secondary to cultivation, and that thorough cultivation will often make irrigation unnecessary.

It is very important for the fruit grower who has the prospects of a good crop to market, that he have everything ready so that it will not be necessary to run for supplies when he should be gathering the crop. Not only would I include under this head boxes and crates necessary for marketing the crop, but I would include the market itself, which it is very important to have prepared to receive your fruit. One of the most important things that a good salesman can do is to visit his market and arrange for the reception of his goods and have a personal meeting with his customers, as in this way he may secure a little extra attention which may make quite a difference on the side of a profit. In almost every market there is a chance to sell a moderate amount of goods of extra quality at a considerable advance over the general run, and it requires but a very little more trouble to pick and pack carefully than it does to do the work in a slovenly manner. In one case your fruit may be sold by the hucksters on the street at the lowest prices and in the other it may be sought after by the select trade.

Among the items that will need attention in the vegetable garden are the following: Set out tomatoes, celery for early use, peppers, egg plant, late cabbage and cauliflower plants and sow winter beets. Plant cucumbers for pickles and beans for main crop. Plant lima beans the early part of the month. Market asparagus, pie-plant, radishes, etc., etc., the same as last month and, in addition, early peas and, perhaps, early cabbage.

Weeding commences in earnest this month and should begin early, since if neglected it may be cheaper to plow up the whole crop rather than weed it out.

Keep the soil well stirred with the cultivator.

Sow rutabaga turnips.

Stop cutting asparagus by the twentieth of the month. Clean up the bed, manure and plow it, then keep it well cultivated.

INSECTS—The insects that are liable to be most troublesome to our fruits at this season of the year are the curculio, which attacks the plum fruits, the tent-caterpillar and the currant worm.

For plum curculio I have found nothing so satisfactory as jarring the trees early in the morning about every other day and gathering and destroying the beetles. This is not a difficult matter and will have a great effect in preventing injury to the plums.

The tent-caterpillar is unusually numerous this year. The forest tent-caterpillar is now stripping basswood and other forest trees of their foliage, and the orchard tent-caterpillar is generally very numerous among apple, plum and cherry trees. Where they are not too numerous and the nests can be easily reached, the tent-caterpillar is most easily destroyed by gathering the nests when the worms are at home, which is generally about the middle of the day in pleasant weather and in wet weather they stay at home all day. Where this does not seem practicable, the best remedy for these caterpillars, and in fact all other insects that eat foliage, is to spray with Paris green and water at the rate of one pound of Paris green to 200 gallons of water. If this material is to be used on plum trees, it should be used at the rate of about one pound of Paris green to 100 gallons of water, and to this should be added one pound of quick lime, which will neutralize the arsenous acid contained in the Paris green and prevent its injuring the plum foliage, which seems to be especially susceptible to injuries of this kind.

The currant worm has put in its appearance and will be found on the under side of the older leaves of currant and gooseberry bushes where it has made holes through to the surface. On a small scale it may be desirable to gather and destroy these leaves with the worms on them, but where the worms become abundant and are pretty generally distributed over the bushes some poison must be used. The most popular remedy is white hellebore, used at the rate of one ounce to a gallon of water. The hellebore may also be used dry or mixed with flour and dusted on by bellows. Paris green and water will also be found a satisfactory remedy, used in about the same proportion as for the potato bug.

Among the things that have looked especially pretty during the month of May are the following: The old shrubs such as the lilacs, honeysuckles and snowball have been more than usually vigorous and pretty, but, in addition to these, the tulips, which have now been with us, including the early and late kinds, for about four weeks, have done especially well. The native sheepberry is just now in its glory and makes a very fine, large shrub. The Eleagnus, with its gray foliage, is now in pretty contrast to the deep green of the grass and to most of our shrubs. The flowering almond was a mass of beautiful white flowers but is now gone. The flowers of the Caragana, too, have disappeared, but the shrubs still preserve their freshness and vigor and are very desirable for variety.

The Van Houtii spirea is as good as ever and just now in full flower and makes a gorgeous display. The irises are also very showy, the peonies are about three feet high and full of buds, but will not be open before the middle of next month, with the exception of the shrub peony, which has been in flower for about one week. Our native red-berry elder produced its large snowball clusters of flowers in great abundance the latter part of April, and the common elder is just beginning to show its flower clusters. Rubus deliciosus, with its white rose-like flowers, has been in bloom for about ten days and seems to be gaining in popularity. The evergreens are now at their prettiest, and the new growth in its fresh light green shades is almost as pretty as our flowering shrubs.

Secretary's Corner.

SUMMER MEETING.—Do not fail to see the notice of our summer meeting to be found elsewhere in this number,—and do not fail to come.

PARIS GREEN AS AN INSECTICIDE.—One pound of Paris green to 200 gallons of water is considered about the right proportion to ensure the destruction of insects without injury to the foliage of the trees; at least, so says one of the best authorities on the subject.

THE MEMBERSHIPS FOR 1898.—The last memberships issued by this society for the year past before going to press is No. 681, and the person holding it had at that time, we believe, the only ticket of a state horticultural society of so high a number ever issued in the United States.

A. H. BRACKETT AT HOME.—We are glad to welcome our ex-treasurer, A. H. Brackett, back from a winter in Alaska, where he has been assisting his father in his enterprise in opening a road over the mountains into the gold regions. He reports horticulture as languishing in that region, and glad to see Minnesota again.

COLLEGE OF FORESTRY IN NEW YORK.—Prof. B. E. Fernow has accepted an appointment as director of the New York State College of Forestry, a branch of Cornell University. This new work is in pursuance of a late act of the legislature of that state, and important practical results are expected from this departure. Prof. Fernow is well known as late chief of the U. S. Division of Forestry and has made many friends in Minnesota during his visits here.

CURTAILING THE FORESTRY RESERVES.—The American Forestry Association concurs in certain proposed legislation by congress to set aside in a measure the proclamation made by President Cleveland creating certain forest reserves. The facts in regard to this are not at hand, but it is to be hoped this is not a backward step in a work of such far reaching value to our country as the preservation of its large forest areas, which are rapidly being cut down by the ruthless hand of our unfeeling commercialism.

THE RECOUNT FOR PRESIDENT.—On account of the charges publicly made, that if the count had been fairly conducted, Mr. Brand would have been found elected president at the late annual meeting, it was thought wise to invite the members to participate in a recount. Accordingly a circular letter and return postals were sent out February 25th to all the members entitled to vote at that elec-

tion who were not known to have been absent. If it is found that after all any of them have been overlooked,they can still report and the count be changed.

The election as announced gave J. M. Underwood 116 votes, and O. F. Brand 42 votes. The recount shows J. M. Underwood 112 votes, and O. F. Brand 10 votes. We should be very glad to make this ballot a complete one if the members see fit to do so, and it can yet be done. The ballots as received in the recount are on file in the secretary's office and,with the exception of three marked "confidential," are accessible to any of our membership.

HORTICULTURAL HALL, PHILADELPHIA.—Our frontispiece is a front view of the new hall just completed by the Philadelphia Horticultural Society, which "Harper's Weekly," through whose courtesy the engraving has been secured, speaks of as "the first of its kind in America, and an organization of wealthy and prominent citizens associated together to advance the great art of horticulture through meetings, publications and exhibitions." The dimensions of the building are not stated, but we are given a glimpse of the beauties of the interior: "The grand staircase of pink and white marble rises from the vestibule with a bower of green marble columns and green and gold galleries, surrounded by a bronze-gold dome topped with opalescent glass. The main hall, with vaulted ceiling, and seating an audience of 1,200 people, repeats this color scheme, etc." Evidently a building of this character would meet fairly well the aspirations of the average Minnesota horticulturist, and it might be well for us to know more of this ancient and honorable association.

A CHILD OF THE "CHARTER OAK."—A young seedling tree grown from an acorn of the original charter oak, which still stands in New Haven, Conn., has just been presented to the Park Commission of Minneapolis, and it is expected will in after years cast a shadow of historic pedigree in Loring Park. Other descendents of this noted tree have of late years been planted in various parks of the country. The writer is especially interested in this, as an ancestor, in an early day, had his home in New Haven where the shadow of this oak fell across his front yard with each declining day. We hope to stand under the shadow of this one yet—if it grows fast enough.

THE NEW SWEEPSTAKES APPLE PREMIUMS FOR THE STATE FAIR.—The offering of these new premiums is the most important change in the horticultural part of the premium list of the next Minnesota state fair. Those who compete for these premiums will be permitted to secure apples for this exhibit from any trees growing in our state, though only one plate of any one variety can be shown in an exhibit. Please notice also the important provision that each plate of apples must bear a label containing the name and address of its grower. It is hoped that this kind of an exhibit will result in getting out at the fair a full display of all the varieties of apples grown in the state, including all seedlings, for seedlings are not excluded from this exhibit,and the presence of the labels will locate definitely the place where each is growing and can be found.

These premiums were made possible by the interest in horticulture of Mr. John W. Thomas, of John W. Thomas & Co., the well-known dry goods merchants of Minneapolis, which firm offers the sum of $100.00 to be divided according to merit among the competitors for these prizes, insuring a premium to each exhibitor. In addition to this the state fair board offer first, second and third prizes, increasing the premiums of the highest three competitors by these amounts.

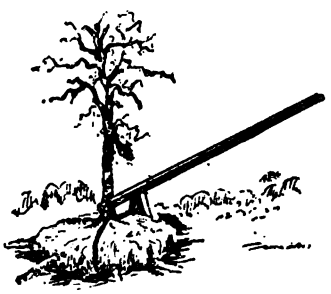
It is confidently expected that these liberal premiums will draw out a number of comprehensive displays of apples, which will show very thoroughly the status of apple growing in the localities represented.

Printed blank labels for use in this exhibit can be secured beforehand in any number desired by application to Secy. Latham.

THE 1898 STATE FAIR PREMIUM LIST—has been sent to every member of this society, and if any one has not received a copy it would be well to address Secy. E. W. Randall, Hamline, Minn., on the subject. Your attention is, of course, specially invited to the horticultural department as published in the list. Do not forget to read over, several times, if necessary, the regulations of this department. They concern you as possible exhibitors much, and a thorough acquaintance with them will aid greatly in making your part of the fair and our department as a whole the success it is our ambition to make it.

Some changes will be found in the list of premiums offered, which you will discover upon perusal, the most important of which to fruit growers is the addition of premiums on "sweepstakes" on apples and for seedling sweet apples. Don't fail to note in the regulations the definition as to what may go into a collection. You will find it clearly and distinctly given in such a way as to settle this vexed question, it is believed, beyond misapprehension.

TRANSPLANTING LARGE TREES.—When a large tree is removed from the ground, as much earth as possible should be taken up with it, so that the small fibrous roots may not be greatly disturbed.



The tree will have a much greater chance of living in its new location if this is done. Dig first about the trunk at some little distance away, but do not cut off the big roots that are met. Follow these out for some distance. When the trench is dug about the tree, work under the roots and get chains or ropes about the ball of earth in two or more directions. Then set a long pry in the manner shown in the illustration, when the tree can be gently raised. A drag or stone boat can then be slipped under the ball of earth and the tree hauled home on it, without disturbing the roots in the least. With the earth left about the roots in this way, even trees of considerable size can be safely transplanted, and they will hardly seem to notice the change in their surroundings.

THE HORTICULTURISTS OF MINNESOTA TAKE DINNER AT THEIR SUMMER MEETING, JUNE 25, 1898.

THE MINNESOTA HORTICULTURIST.

VOL. 26. JULY, 1898. No. 7.

SUMMER MEETING OF MINNESOTA STATE HORTICULTURAL SOCIETY, JUNE 25, 1898.

MISS EMMA V. WHITE, MINNEAPOLIS.

(A condensed report—not verbatim.)

The advent of Saturday, June 25, brought with it the traditional pleasant weather that has characterized the day of the summer meeting for so many years. Clear and cool, there could have been no better time to gather at the State Farm School, where it has now become the custom to hold the annual picnic of the society. About 150 persons were in attendance this year, coming largely, of course, from the Twin Cities and vicinity. It was a pleasure to have Col. Stevens present once more, as well as J. S. Harris, H. M. Lyman, A. D. Leach, D. A. J. Baker, J. T. Grimes, Ditus Day, J. G. Bass and Wyman Elliot and other well known veterans in horticulture, while Col. W. M. Liggett and the professors and students of the Farm School added much to the occasion by their hospitable entertainment. The usual round was followed—the morning spent in visiting the grounds, a valuable object lesson to all practical horticulturists, the writer being, of course, more interested in the beauty of the grounds and the fine show of flowers, especially in the great variety of perennials thus illustrated to be successful in our state—a bountiful lunch served at noon, the display of fruit with the award of premiums and, lastly, the gathering together for a short literary program.

President Underwood called this meeting to order at half-past two o'clock, with a few pleasant words, accounting for the favorable weather from the fact that the best of societies should have the best of weather to meet and feast on the things stored up for these occasions, and congratulating the society on the informality of these gatherings and the opportunity they afford for getting better acquainted.

Col. W. M. Liggett was then introduced to give a word of greeting on behalf of the agricultural school. He expressed his pleasure in according a hearty welcome and greeting, and trusted the society would feel it their home there and hoped the plan they had adopted of meeting at the station for their social reunion would be continued in the future. In closing he called attention to the group of

pictures displayed on the walls of the gymnasium, where the gathering was held, duplicates of photographs which had been sent to the Omaha Exposition. These pictures showed every department of the school, not on dress parade but in its practical working order, and they were much enjoyed by the visitors.

Mr. Clarence Wedge responded, on behalf of the society, to these words of welcome. He said, in part: "It is a great pleasure to respond to this cordial welcome. We do really feel at home here. As I came along the walk and viewed the many shrubs and trees, with their names nicely placed beside them, it was very interesting to me, and I felt that I was in the midst of our own people. The president has called upon a person to respond to this welcome, but I am not much inclined to public speaking, and were it not that it is a topic easily handled and requiring expressions of the heart rather than of the head I should feel like refusing. I am pleased to see that you are turning out real farmers here and not mere book farmers. I have had half a dozen or more of the students at my place and have found them uniformly efficient and proving valuable help. Moreover, they are ambitious, and I have not been able to tempt them by the highest wages to stay with me. They will make truly noble and practical men. We are pleased to have with us today our father, Col. Stevens, and the many other horticultural friends. When I first began to attend these meetings, ten or twelve years ago, I had no idea of the good and value of our society brotherhood. No other brotherhood, sacred or otherwise, is giving more comfort in these days than ours, and I have much pride in belonging to the largest society of its kind in our country. I heartily thank you, in behalf of the society, for the pleasant facilities here offered for us to meet each other in this social gathering."

Mr. R. H. L. Jewett, who had an exhibit of thirty-four varieties of strawberries, from his Faribault home, was called upon to give something of his experience in their culture. He said: "I can raise strawberries better than I can tell how to do it. The raising of strawberries we have grown into almost accidentally down at our summer home. We thought it would be a pleasant thing to have some berries while there, and their cultivation has gradually grown upon us. We fell in love with the strawberry and can't help its branching out. It makes the public, and the man himself, I believe, better for doing it. I studied first the catalogues to get some varieties, not for commercial purposes but for their value for eating." Mr. Jewett then displayed a number of varieties of berries growing on the stem, telling something of their manner of fruiting, prolificness, etc. In answer to a question as to whether he used the matted row system, and other questions, he replied: "I use the matted row system, but am not entirely satisfied with it. The plants are too close and do not get enough room for the roots. I have been more successful with spring planting—planting early in the spring. After the crop is gathered I mow the ground, spread with straw and burn it over and, after getting two crops, plow it up. Perhaps it is well to state that my strawberries are planted in my orchard, between the rows of trees. I have a plant for irrigation, a home-made plant, but have not had occasion as yet to use it."

Mr. Harris being called upon, responded with a few words about apples and strawberries for Minnesota. "I always go to the front," he said, "when called upon. When Gen. Scott called me to the front in the Mexican war, I went. When Minnesota called me to the front to plant apple trees I went, and I still feel that I am at the front. The first apples we planted in Minnesota were from the far east. They were often not adapted to our soil or climate and were virtually dead when they got here. So the croakers said we never could raise apples in this state, and when we attempted to develop the capacity of Minnesota the army of croakers had grown so large that it was difficult to find twelve men (and one of those was a woman) to put their names down to organize a horticultural society. It has not been conceded until lately that apples are a success here. But now the cry is: 'You can't raise winter apples in Minnesota.' From all appearances the time is at hand when we can raise winter apples and become independent of all outsiders. Here is a plate of seedling apples from Mr. Siebenaler's place in Hastings. They have been kept without any artificial aid and are still firm and sound. Mr. Siebenaler has never seen a blighted leaf on the tree, and never has given it any particular care, as he did not suppose it was worth anything. This is an interesting object lesson. We are spending thousands of dollars each year in sending to eastern nurseries, which we might better spend in experimentation at home. Save and plant seed of the hardiest and best apples you can find. Take care of the trees, and if they come into bearing, don't 'corner' them. When you get trees send them throughout all the state so we can say Minnesota is the best fruit state in the Union.

"Among the most promising strawberries I have seen this year is the Splendid, which originated in Illinois. It is of uniform size and a good bearer. They say you can pick four quarts in five minutes. It is a good berry for the market. I know of nothing better for the farmer than the Bederwood. The Warfield is the best for productiveness, with the Lovett to fertilize it. The Brandywine is excellent for marketing, and in canning it comes out perfect in color. It is not so productive as the Bederwood, but the plants are strong and healthy and the berries easy to pick."

Col. J. H. Stevens was called upon by the president, meeting with hearty applause as he took the floor. He said he fully appreciated the honor shown him, but as he could not make himself heard by all present, he would cut his remarks short, presenting only a resolution which he hoped would be adopted by the society. The resolution was as follows:

WHEREAS, This society recognizes the value to the pomology of the Northwest of the experiments which Mr. Peter M. Gideon has been and is conducting at his home in Excelsior, and

WHEREAS, By the recent fire destroying his residence and its contents, unprotected by insurance, he has been much crippled in his efforts to prosecute this important work: Now therefore,

Resolved, That the executive board of this society be requested, if in their judgment the funds of the society will warrant the expenditure, to appropriate $100 to aid Mr. Gideon in the continuance of these experiments, without, however, restrictions as to the use to which it may be put.

The resolution was discussed by Messrs. Elliot, Guiteau, Underwood, Prof. Hays, Grimes and others, the feeling being almost unanimous that the society would do well to recognize Mr. Gideon's services to Minnesota in this way. Prof. Hays was of the opinion that there were yet many trees on Mr. Gideon's place that would prove to be good varieties for Minnesota, and he would like to see him able to carry on his work. President Underwood called Mr. Wedge to the chair that he might also say a word for the passage of the resolution. Mr. Grimes suggested that two birds be killed with one stone by the members each paying one dollar toward the fund and at the same time making some friend a member of the society, suiting his action to his word. A rising vote was called for, resulting in thirty-nine votes to two in its favor.

Mr. Clarence Wedge spoke briefly on what he was pleased to call his new hobby,

A NEW ROSE FOR THE NORTH.

"Blanc Double de Courbet" is the name which some wordy person has chosen to inflict upon a most beautiful and valuable white rose for our state. It is a hybrid of the Rugosa and retains its hardiness and beautiful foliage together with the double blossom of some other rose with which it has been crossed. The catalogues mention it as bearing roses measuring five inches in diameter, but three and one-half to four inches is about the size they average at our place. They are not fully double and like many of our good varieties make the prettiest show when a little more than half open. It is produced in clusters of five to six, and each blossom remains in good form about two days. Like its Rugosa parent it blooms in periods throughout the summer.

"We have only had this rose two seasons, and it is very likely to develop some virtues or failings that we are not aware of today. We confess a strong bias for those fruits and flowers that are naturally adapted to our soil and are able to hold their own against cold and drouth by natural 'force of character.' The original Rugosa rose is pre-eminently such a plant, and one that should be more generally grown and appreciated. Although a single rose, it has features all its own that besides its hardiness should commend it to a place in every ornamental plantation, and its hybrids bid fair to give us roses that will be the peer of those of any clime."

Dr. Mary Whetstone in presenting a very interesting paper on mushrooms said: "You have been talked to about missionaries. I come in that capacity. A missionary brings something not previously enjoyed. These other missionaries have told you about the best fruits adapted to our state. I come to tell you of something older than the state, the mushroom as an article of diet. I have given but two years' study to the subject, and find Prof. Lugger has forgotten more about mushrooms than I ever knew." (For this paper see index.)

This paper was supplemented by a talk from Prof. Lugger, who proved to be a veritable encyclopædia on the subject, although he said he had not paid any attention to it for many years. He said in part: "I used to pay much attention to this study, and

prepared 460 illustrations of specimens growing in Virginia, but a fire swept them all away. I have studied also the insects that make their home in mushrooms. They know what is good to eat and make no mistakes. Mushrooms are found everywhere, but are more numerous where there is decaying animal or vegetable matter. Sometimes they grow for years in fine threads, as fine as a hair. and then, when the conditions are favorable, they start up and grow so rapidly that it is past believing. These plants are scavengers. They live on material not useful and transform it into something useful. Like meat they contain all the elements needed to sustain life. It is true some are poisonous, and there is no rule to determine the good from the bad. The best way is to have good illustrations, and then begin, not by trying all kinds, but by trying a certain few. In Germany the public schools are provided with such illustrations. There are in the United States 8,000 described species, and in all there are 150,000 known species of mushrooms."

Miss White was called upon to tell something of the organization of the Woman's Auxiliary Horticultural Society, which was effected in the morning, an account of which will be given elsewhere.

Mr. E. W. Randall called attention to the state fair and to the liberal premium list on fruits adopted this year by the state fair board, in addition to which is a sweepstake prize of $100 for apples, offered by Mr. John W. Thomas, of Minneapolis. He spoke of the growth of the fair in almost all its departments, and hoped the horticultural society would have a still larger exhibit than in 1897.

The following resolution was presented by Mr. Wyman Elliot and adopted by the society:

Resolved, That, in our opinion the interests of our state require that more attention should be given to fire protection of our forests and to the study of practical and rational forestry principles.

Gen. C. C. Andrews, state fire warden, made a strong plea for rational forest preservation and protection of the lumber interests of the state. "I am glad." he said, "that the horticultural society is so well established that it need not fear to pass a resolution for the benefit of the public. I heard of some ladies in St. Paul who wanted to go into the pine woods. I really did not know where they could go. I did know of villages near which there were once fine forests, now they stand bleak and bare. If I could have my way I should have a small forest left in the vicinity of each village in the lumber districts. They would be of as much comfort as are the Adirondacks in New York, where large forest preserves have been established through the demands of people who wanted a chance to go into the forests. It is New York also that has taken the lead, through Cornell University, in establishing a college of forestry. Pennsylvania and other states have done as much. There is an industrial side to this question also. I am told that the pine that is cut in Minnesota in one season, just as it stands, is worth five million dollars, and when sawed it is worth ten million dollars. This shows the large interests and great amount of wages involved in our lumber industries. It is worth while to protect and perpetuate this enormous industry, and I trust this organization will uphold these interests in Minnesota because of their great public benefit."

Prof. W. M. Hayes spoke for the resolution, saying he had looked over a good many lands in the northern part of the state which would be an actual injury to Minnesota if brought into agriculture, but a great blessing if left for forest crops. There should be state management of the forests.

The passage of the forestry resolution closed a very pleasant though informal program, and the company dispersed, with feelings of gratitude to the officers and teachers of the farm school for a very enjoyable day.

AWARD OF PREMIUMS

At the Summer Meeting of 1898,

of the

Minnesota State Horticultural Society.

STRAWBERRIES.

Article.	Exhibitor.	Premium.	Amount.
Clyde	Wm. Danforth	Second.	$ .50
Bubach	"	Second	.50
Bederwood	T. Redpath	Second	.50
Capt. Jack	"	Second	.50
Warfield	"	First.	.75
Gandy	"	First	.75
Bubach	"	Third	.25
Timbrell	"	Second	.50
Greenville	A. G. Wilcox	First	.75
Brandywine	"	Second	.50
Bisel	"	Second	.50
Dayton	"	First	.75
Haverland	"	Second	.50
Lovett	"	First	.75
Dr. Stamens	Gust Johnson	Second	.50
Edgar Queen	"	Third	.25
Gillespie	"	Second	.50
Marshall	"	Second	.50
Dayton	"	Second	.50
Cumberland	"	Second	.50
Warfield	"	Third	.25
Lovett	C. Sampson	Second	.50
Collection, 14 var	"	First.	4 00
Jay Gould	"	Second.	.50
Tennessee Prolific	"	First	.75
Glen Mary	"	Second.	.50
Parker Earle	"	Third	.25
Jessie	"	First	.75
Clyde	"	First.	.75
Princess	"	Second.	.50

Article.	Exhibitor.	Premium.	Amount.
Brandywine	W. H. Brimhall	Third	.25
Cyclone	"	Second	.50
Enhance	"	First	.75
Splendid	"	Second	.50
Bederwood	"	Third	.25
Wilson	"	First	.75
Barton	A. H. Brackett	First	.75
Lovett	"	Third	.25
Enhance	"	Third	.25
Brandywine	"	First	.75
Bubach	"	First	.75
Splendid	"	First	.75
Beverly	"	First	.75
Woolverton	"	First	.75
Bederwood	"	First	.75
Haverland	"	First	.75
Leader	"	First	.75
Princess	"	First	.75
Gandy	"	Second	.50
Capt. Jack	"	First	.75
Parker Earle	"	Second	.50
Wm. Belt	"	Second	.50
Noble	"	First	.75
Edgar Queen	"	Second	.50
Marshall	"	First	.75
Warfield	"	Second	.75
Collection, 6 var	"	Third	2.00
Edgar Queen	R. H. L. Jewett	First	.75
Staples	"	First	.75
Bisel	"	First	.75
Van Deman	"	First	.75
Haverland	"	Third	.25
Gertrude	"	First	.75
Splendid	"	Third	.25
Woolverton	"	Second	.50
Brunette	"	First	.75
Wm. Belt	"	First	.75
Greenville	"	Second	.50
Aroma	"	First	.75
Premium	"	First	.75
Snowball	"	First	.75
Weston	"	First	.75
Epping	"	First	.75
Fountain	"	First	.75
Rio	"	First	.75
Sunnyside	"	First	.75
Arrow	"	First	.75
Kyle	"	First	.75
Drought King	"	Second	.50
Gem	"	First	.75

Article.	Exhibitor.	Premium.	Amount
Muskingham	R. H. L. Jewett	First	.75
Mary	"	First	.75
Homestead	"	First	.75
Enhance	"	Second	.50
Smith Seedling No. 1000	"	First	.75
Parker Earle	"	First	.75
Cyclone	B. T. Hoyt	First	.75
Collection	W. L. Parker	Second	3.00

GOOSEBERRIES.

Houghton	T. Redpath	First	.75
Downing	G. Johnson	Second	.50
Smith's Improved	"	Second	.50
Downing	C. W. Sampson	First	.75
Smith's Improved	"	First	.75
Red Jacket	"	First	.75

CURRANTS.

Fay	G. Johnson	First	.75
Victoria	"	First	.75
Victoria	C. W. Sampson	Second	.50
Fay	"	Second	.50

J. S. HARRIS,
WYMAN ELLIOT,
Judges.

FLOWERS.

Bouquet	Miss N. McCammon	First	1.00

PROF. S. B. GREEN,
Judge.

PLANT BEANS EYES DOWN.—I had always been taught to plant lima beans with the eyes down, stuck carefully by hand; but last summer, when planting my Burpee's bush limas, it occurred to me to experiment. I had four rows fifteen rods long furrowed out and manured in the furrow, all precisely alike; two rows were stuck carefully by hand, eyes down; two rows were dropped the same as corn and covered with a hoe. The two rows that were stuck came up promptly, and all at once, making unbroken rows the length of the piece, with hardly a bean missing; the other two rows began to show a day or two later, a few at a time, and were about a week in getting up, and then were a ragged looking lot, there being many gaps. Then the cutworms got in their work, and the result was, those two rows were almost a failure, while the rows that were stuck throve and grew away from the worms, and made a good crop. I think we cannot be too careful about publishing premature results of experiments, as much harm may be done thereby.—Ex.

REPORT OF THE SEEDLING FRUIT COMMITTEE

J. S. HARRIS, LA CRESCENT.

(Made at Annual Meeting Dec. 7, 1897.)

Your committee has not been as dilligent in its work as you may perhaps have desired or intended, or even as we expected to be. It was our intention to visit and examine a considerable number of trees in different parts of the state immediately after the close of the state fair, but we changed the program, so that instead we paid a visit to the fruit region of southwest Missouri and northwest Arkansas, commonly known as the Ozark country, making a rest and recreation of it as well as getting better posted on fruit culture.

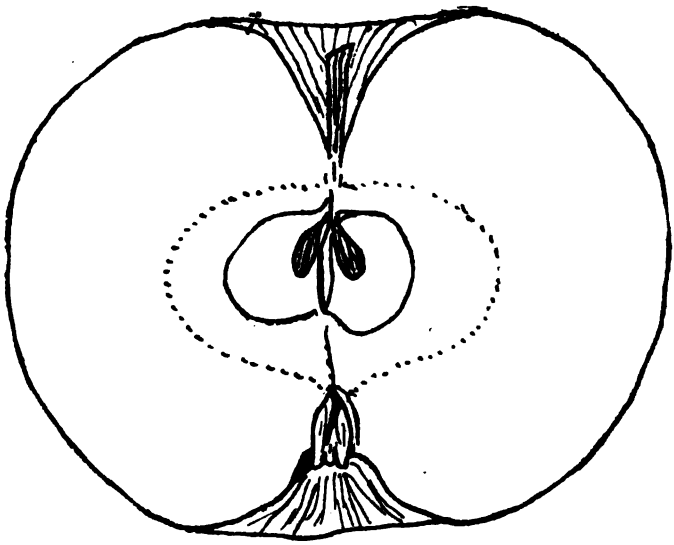
Previous to making this trip and along in the month of August, we spent a few days in traveling over portions of Houston county and visited the orchards of Wm. Oxford, Freeburg; James Layland, Reno; Peter Ernster and Mrs. Stadtler, Caledonia, and several others. The seedlings at Mr. Layland's were not fruiting very much but looking well. We had thought heretofore that the best variety might be the Knight's seedling, or Ladyfinger, sometimes known as Red Pearmain, but in tracing it up and comparing with the genuine we find that it had its origin in Vernon county, Wisconsin, where it is known as Morgan seedling and proving hardy and productive. Mr. Layland's trees are from sprouts of the roots of a tree that killed to the ground some 15 years since, while the sprouts were not injured. The trees are moderate growers but prodigous bearers in alternate years and so far have never blighted. The fruit is about medium size, very handsome; season, midwinter. The tree at Peter Ernster' swas injured on one side last winter by the burning of his dwelling, but shows no other signs of weakness. It is eighteen or twenty years old and a regular annual bearer; fruit much like the old Vandevere in quality but of different form; keeps well through the entire winter The fruit was not mature enough at that time to secure samples for keeping. We think it is hardy enough for favored locations and that it may prove of great value for crossing with some of the Russians and the best Siberian hybrids to secure varieties of winter apples more perfectly adapted to this climate, and we recommend that as soon as a start can be made in it scions be distributed for top-working on some of the Gideon seedlings to secure crosses.

The tree of the Eberhard seedling, at Mound Prairie, has again wintered all right after maturing a heavy crop last year, and again this year it carried several bushels of fruit. The tree is forty-two years old, and the present owner says it has never missed fruiting but once in over thirty years. Of course, this is considered to be about the most favored part of the state for apple growing, and varieties doing well here might not do as well in more unfavorable locations; yet they are worthy of trial and will certainly aid us through the production of seedlings in the advancing of the cultivation of good winter apples considerably further north.

The orchards of H. C. Decker, of Dresbach, and J. C. Kramer, La Crescent, contain a number of seedlings that fruited very heavily this year. The trees are generally looking well but are yet too

young to form an estimate of their value. The Oxford Orange trees, of Wm. Oxford, at Freeburg, after bearing an enormous crop in 1896, again this year bore a very heavy crop, while the trees are hardy and healthy here. The fruit is very fair and keeps well until the holidays. It is also doing well at the La Crescent station. A few young trees of it can be furnished for trial.

On August 27th we visited the seedling orchard of Thomas Lightly, in Freeborn county. The orchard contains about sixty seedling trees, procured of Peter M. Gideon several years since. They were carrying a good crop of fruit of fine appearance and presented a sight that was worth going many miles to behold. We have had the trees numbered, so that F. W. Kimball, of Austin, or your committee know where to find each variety, and we have made



FOSSBURG.

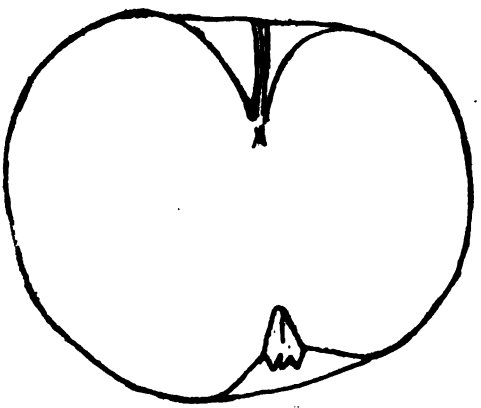
descriptions of about fifteen of the varieties. The trees have never been given much care or cultivation but generally appear to be thrifty and healthy, except some that were badly gnawed by mice last winter; but most of them will probably recover. This ought to prove a warning to every one who has a promising seedling to send a few scions to trial stations to be propagated and tested, so that the variety may not be lost through some accident. We also on the following day visited a number of trees at Austin and Rose Creek and in that vicinity but did not think any of them of any special value, unless it might be a Duchess seedling of J. C. Walker, at Rose Creek. The tree looks fine but was not bearing this year, and we have never seen the fruit of it.

Few samples have been sent to us for examinaion during the year. We are always glad to receive specimens, and if they are received in good condition place them on record by making outlines and descriptions. For this purpose the specimens should be of good aver-

age size and typical form of the variety and carefully picked to prevent loosing the stem, and when known a history of the tree should accompany the fruit. Among samples secured since our last report are the Fossburg, of the Jewell Nursery Co.; North Star, by C. G. Patten; and Ethlyn, from Edson Gaylord, that merit more than passing notice and are likely to soon appear in nurserymen's catalogues.

The Fossburg is a large fruit; size, 8; weight, 9 oz.; form, oblate round, tapering a little towards the eye; color, greenish-yellow ground, striped and splashed with red; skin, a little rough to the feel, from numerous slightly raised, grayish dots over the surface; stem, medium short, set in a rather broad, deep, greenish or light russeted cavity; calyx, open in a medium deep, abrupt, wrinkled basin; flesh, yellow, a little coarse, of mild acid flavor; season, late October.

North Star. This is from seed of a large russet hybrid supposed to be a cross between the Golden Russet apple and a Siberian crab. The fruit is about medium size (4 to 5); weight, 4 to 5 oz.; form,

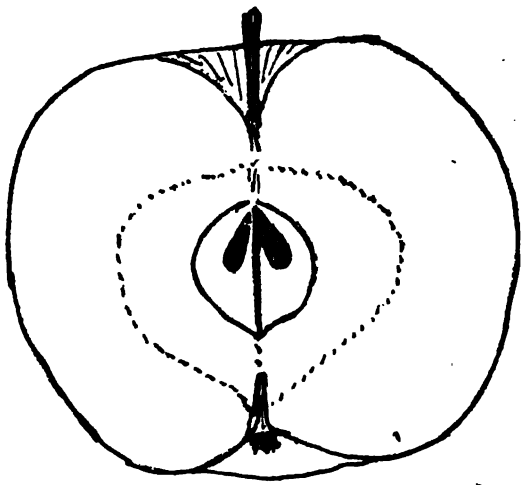


NORTH STAR.

smooth, flattish round; color, yellow with light bluish cheek, and sprinkled over with light grayish dots; stem, short, medium, in a regular smooth russeted cavity; calyx, partly open, in a broad, shallow, wrinkled basin; flesh, yellow, firm, fine grained, tender; flavor, spicy, sub-acid, good; season, early winter; a fine eating apple; origin, Iowa.

Ethlyn, by C. H. Griffith, Eagle Grove, Ia. Size, 4½; form, roundish; color, yellow, striped with red on sun side; stem, medium long, set in a medium deep, grayish, russeted cavity, often showing the Roman Nose on one side; calyx, small and closed, in a broad, shallow, slightly wrinkled basin; core, small and closed; flesh, firm, fine grained, deep yellow. The flavor is a pleasant acid and very good; season, winter, December to March. This variety has an interesting history. It was produced from seed of Bethlemite apples grown on a top-graft inserted in the limbs of a wild native crab, a portion of the top remaining ungrafted. The first seeds were planted in 1878, of which only two grew. The trees were set in orchard in 1882

and first fruited in 1887. Planted seed again in 1879-1880, none grew. In 1881 one seed grew, and the tree was planted in orchard in 1885 and bore first fruit in 1889. The three trees have borne fruit every year since they began to bear. The trees all look alike, and the fruit is so near alike in size, color and flavor that no one is able to distinguish any difference. In 1891 one of the oldest trees produced eleven measured bushels, being the fifth crop and but thirteen years from the time the seed was planted. There were no other tame apples bearing upon the farm at the time the seeds were saved except one



ETHLYN.

Utter, likewise top-grafted on native crab but standing on the opposite side of the highway. No other tame apples were growing within one mile. The originator thinks the angles of the branches, notching of the leaves, straight down on the under side, and the blossom end of the fruit, show traces of the wild crab, and it is thought by some to be a hybrid between the apple and the crab. We do not think so, but that these traces come from the influence of the stock on the graft and that they are more marked because a portion of the tree still carried crab top.

Mr. Elliot: I would like to ask Mr. Harris if in his effort in hunting up new seedlings he has ever found anything in the way of a new seedling that is superior to the Wealthy?

Mr. Harris: No, not in every respect. The Eberhard seedling is a longer keeper than the Wealthy and no doubt as hardy a tree and freer from blight, but it has not been tested outside of the place where it originated. I got a very few scions last spring and started them. I have one tree that bore year before last. I believe there are some among those Gideon seedlings, that he sent out, that will prove to be as valuable as the Wealthy, and will be as large, of as good quality, if anything, and hard-

ier and freer from blight. I believe there are some varieties in the orchard of Mr. Lightly's that are worthy of propagation. I believe that orchard should be visited every year, and Mr. Kimball and myself know where they are.

Mr. Dartt: Will Mr. Harris tell us what he knows about the Minnetonka apple?

Mr. Harris: I inquired all around but nobody knew anything about it, and Gideon says he knows nothing about it. A few years ago there was an apple out which was said to have originated at Minnetonka and was sold around our place. After it began to bear it proved to be the Ben Davis, and I suppose the Minnetonka apple is of the same stripe.

THE SUCKER AND CAP VARIETIES OF RASPBERRIES COMPARED AS TO PROFITS.

H. C. ELLERGODT, LANESBORO.

When I was asked by our secretary to write a paper on this subject I wished it had referred to watermelons and muskmelons rather than berries, because I believe I could then have given some of our members a good impetus toward planting and raising more of this delicious and thirst-quenching fruit, as this has been my occupation for twenty years.

Fruit raising with me is of a more recent date, so that the conclusions I have come to regarding which is the more profitable variety to grow, the sucker or the blackcap raspberry, may not hold good here in the future and for other localities.

The growing of blackcaps here has been a success. They have produced a good crop every year, and that without winter protection.

The red raspberries have some years produced a good crop also, but other seasons they have been a failure, although they have been covered in winter. Then, by comparing one year with another, the black ones have produced the more fruit and the berries of both kinds have sold here in this and adjoining markets for the same price most of the time except, in a few instances, when the blackcaps have sold for a little less than the red raspberry; but I believe that the general trend of the market in the larger cities is that the berries of the blackcap variety sell for less than the red raspberries.

Taking everything into consideration the red raspberries cost the more of the two varieties to raise, because a constant war has to be waged against the young suckers that they shall not sap the life blood out the parent plant and hinder it from bringing forth a crop of berries. The trimming out of the canes to the right number in the hill is also an item of expense which is not so much with the blackcaps, and my experience has led me to believe that the red or suckering kinds are more liable to disease, making it necessary to apply preventives and fungicides, which also cuts down the profit of that variety—so that my verdict will be in favor of the blackcap varieties.

PROBLEMS CONFRONTING THE SOUTH DAKOTA FRUIT GROWER.

W. S. THORNBER, BROOKINGS, S. D.

It would be impossible to enumerate in one brief paper all the problems that are confronting the South Dakota fruit grower, so I shall try and confine myself more particularly to the prominent ones.

Many will verify the fact that South Dakota is not a "Garden of Eden" and, in all probabilities, if the prevailing environments continue will never be one.

Less than fifteen years ago the greater portion of our state was a vast, treeless plain, with not so much as a native willow to check those fierce and merciless winds which traversed all parts of the state. Very few native groves appeared along the streams, while the prairies were broad and expansive on either side. This was the time, while hundreds of dollars were being expended every spring and fall for unsuitable and worthless nursery stock, that Dakota needed a horticulture of her own. But South Dakota, like all other new states, has had to get her experience in tree planting by doing. It was during this period of its development that the idea of South Dakota ever raising any fruit was almost killed. Nor did some of our neighboring nurserymen (I hope there are none of them here today) help matters in the least when they permitted, or in some instances sent out, smooth-tongued tree-peddlers to make the farmers believe that anything and everything would grow in South Dakota. They in this way supplied the farmers with many dollars' worth of tender nursery goods, which would have been very dear as presents to most of them.

We must not blame the nurserymen alone for all the early failures, as many are due to the practice of fall planting, which was so common in early days. Professor N. E. Hanson very nicely forbids fall planting when he says, "Don't do it, for our Dakota winter winds will drive the sap from a fence post." In many parts of our state remnants of orchards of early days lift their heads but little above the quack grass and weeds among which they have been left to die.

It is more than probable that the factor most detrimental to our early work was the unsubdued condition of the soil planted upon. The majority of our farmers came from Minnesota, Iowa, Wisconsin and Illinois, in which states they had seen the soil subdued with less labor and trees and shrubs grown with less care. They soon found to their sorrow that it was utterly impossible in three years, with ordinary treatment, to kill the quack grass which grows so abundantly on our breaking.

Such were the early drawbacks to growing fruit in our state, but in spite of these difficulties many successful orchards were established.

The past few years we have been greatly encouraged over the prospect that soon we should be able to supply the greater portion of our home demand. By correspondence, reaching nearly every or ganized county in the state, I learned that in all parts of the state a

few men are meeting with fair success in growing fruit. And every successful orchard in the state becomes an object lesson of the highest value, encouraging and teaching every passer-by the lesson that to some seems hard to learn, the lesson of successful fruit culture.

Many of our farmers find it exceedingly difficult to get trees, even from well established nurseries, that are true to name, and hardly ever is this possible from tree agents. As a rule, these agents find a nursery overstocked with undesirable trees, which they buy at a great reduction in prices, then re-label and send out for whatever the order calls; and as most of our trees have been bought from roaming agents, is it any wonder that so many of them have failed? Under the prevailing system, it is essential that live nurseries have agents to advertise their stock, for not one farmer in one thousand would ever go to the nursery at the proper season to procure the necessary trees and shrubs to plant a farm.

We feel and believe that if we were able to control the varieties and quality of the supplies that will be planted in the state for the next five years, that we could do more for the fruit growing industry of the state than could be done in any other way. But as long as nurserymen will send out any of the tender varieties as suitable stock for our planting, we are under the influence and at the mercy of these men whose interests are not with us. So what we need first of all are good, honest, interested and experienced men, who will use their influence as to varieties and will send out only those that are sure to stand. In this way they can gain the confidence as well as the patronage of the true farmer.

We have come to believe that the cold winters are not our worst enemies but rather that our high, dry atmosphere, which is so abundant in all parts of our state, is the severest test of hardiness. From experience we know trees from an atmosphere as dry as ours though much warmer will stand much better than those from moist atmosphere even though located in colder climates. At different times planters have tried to avoid this failing in the trees by starting small nurseries in the semi-arid belts, thinking that trees grown there would stand the dry atmosphere, but too small a percentage of the grafts live through the first winter or on account of the drought ever start at all. The main trouble came through the tender roots killing out during the winter, but this is partially overcome by the use of Siberian stocks or propagation by means of the cutting graft. Since we realize that most of our supplies must come from moist atmospheres, we must select those varieties that will stand the drought.

Eastern and southeastern Dakota's climatic conditions are very moist as compared with the central and western parts of our state. Several varieties of trees are known to do well in the eastern part which utterly fail in the west. The hard, or sugar, maple which is a native of Minnesota, Wisconsin, Canada and recently found in South Dakota, where the atmosphere is cold but damp, fails completely in those parts of the state where it is very dry. The Golden prune, a native of California, is a grand success in parts of our state. It is

for the same reason that the Fameuse apple thrives in Canada but is a rank failure in South Dakota. From this data, the sooner we give up the idea that it is our cold winter alone that kills our trees, the sooner will our prairies be dotted with orchards and plantations.

Another drawback has been the lack of cultivation, both before and after planting. We have a very hard subsoil, loosening of which manifestly aids the tree planter. In an experiment at the College Station as to the behavior of the roots of seedling trees with ordinary culture or on sub-soiled land, it was fully demonstrated that there was a great advantage to be had by subsoiling. Many growers have found it beneficial to give complete culture to the orchards and never seed them to grass or clover, for as soon as the grass once gets started the trees cease to grow. Probably the hardest question to solve is the one of late spring frosts. It has been estimated that the crop of 1897 was reduced 90 per cent. by the frosts the latter part of May. It seems almost an impossibility to pile up enough brush straw and etc. to keep the temperature above freezing for a period of three or four nights in succession, but, nevertheless, many of our most successful men are doing this.

Until recently our orchards have been comparatively free from blight, but last year seems to have been a bad year, for out of fifty varieties of mostly Russian apples and crabs the Shields crab was the only one that was perfectly free. The Martha and Duchess were only slightly affected, while the Early Strawberry and Transcendent crabs were so badly used up that it was found advisable to remove the trees bodily from the orchard.

During the past five years the jack rabbits have been increasing so rapidly as to cause no little alarm as to how we are to protect our orchards. It is not an uncommon thing to see them running in droves of from fifty to one hundred and fifty. As yet they are not doing the damage that the wood, or cotton-tail, rabbits are doing, because they do not burrow under the snow, but rather prefer the young, tender shoots which project above the snow, and are especially fond of one year old trees. The average farmer will be able to protect his few trees from rabbits by means of wire netting or laths and wire, which will serve also as a protection to the stems of the trees from sunscald.

Aside from the apple, other fruits have met with similar drawbacks. In parts of our state, and more especially along the Missouri river, are thickets of wild plums of the yellow and red varieties. They are, of course, hardy and adapted to the climate, except where the trees have been pruned very high, in which cases the stems have become sunscalded, which is common in all orchards where the trees have not been headed very low. Scattered over the state are a few very creditable plum orchards grown from pits and trees obtained along the river.

The Buffalo berry (Sheperdia argentia) and sand cherry (Prunus pumila) are both being cultivated, with the expectation of developing palatable fruit from them.

Strawberries have done fairly well where they have had a reasonable amount of care, but too many people take care of them during

the fruiting season only, and many patches have fruited accordingly. Gooseberries and currants have proved a grand success in the dryest parts of the state when planted and properly cared for.

We have comparatively little rain in the western and central portions of our state, but the soil is remarkably retentive of moisture and under thorough cultivation yields up for the use of growing crops all the moisture necessary for their perfect development.

We of South Dakota are learning the secret of successful horticulture: we must stop plowing four inches deep and begin to plough twelve; we must continue to cultivate; we must all become horticulturists, in that we put a great deal of labor upon a little land. We have learned that groves that will hold the winter snows and send them melted over the fields in spring are almost as good as arte sian wells. We have learned the value of vegetables and fruits, and in time we hope to be as fair a state as the "beautiful lands" from whence so many of us came.

Mr. Gibbs: I consider this one of the best papers we have had here. It struck me as a remarkable paper from so young a man. After living twelve years in South Dakota engaged in horticulture, I wish to say I could not offer a single criticism on that paper as to the condition of horticulture in South Dakota.

Mr. Cook: I would like to ask Mr. Thornber whether he can give us any information about the Odegaard plum.

Mr. Thornber, (S. D.): The Odegaard plum originated in Brookings, and it is doing a great thing there. It is fruiting early in the season and early in age. It is similar to the Wolf in many respects but stands much better with us.

Mr. Cook: How do its bearing qualities, its ripening and its selling qualities compare with the Cheney?

Mr. Thornber: It is earlier than the Cheney, and it is very productive.

Mr. McGinnis: Did I understand you to say that hard maple is a native of South Dakota?

Mr. Thornber: Yes, sir.

Mr. McGinnis: What part?

Mr. Thornber: Northeastern.

Mr. Dartt: I want to make a little reference to the remarks of my friend Gibbs. He thought it was a remarkable paper coming from so young a man. He does not seem to realize that men grow old and foolish with age; if you do not believe it look at me. (Great laughter). One point I wish to refer to in connection with the paper, and that is, I think an important matter that must be taken under consideration by the tree and fruit growers of South Dakota is protection against rabbits. I think

they will find it necessary, distinctly necessary, to protect against rabbits, or else they will fail. I think fencing with wire fence, surrounding the entire plantation, will be their only effectual remedy. I have had experience in fencing against rabbits, and it has proved a success so far. Of course, if you are a little negligent and let rabbits get in in the summer you have just the same trouble to get rid of them in early winter. With a little effort or, if necessary, with considerable effort, a fence of perhaps three feet high would effectually keep out rabbits. It is very effectual, and I believe they will find it absolutely necessary to do something of the kind when rabbits travel in droves of a hundred to one hundred and fifty.

Mr. Gibbs: What are you going to do when they get under?

Mr. Dartt: Where the snows are likely to be deep I would ridge it up and build the fence on top of the ridge, so as to make it a foot or two higher than the snow. It is more necessary to protect the top than the bottom. I have found it necessary to put a couple of strands of barbed wire on top of my fence. That has a strong tendency to keep out the boys (Laughter.)

Mr. Thornber: A man would have to build a fence fourteen feet high to keep out jack rabbits. In the eastern part of the state, where I have lived the past three years, the rabbits have not bothered very much; it is only in the western part, and more particularly in the central part.

Mr. Kramer: Buy hog's liver and smear the trees; they will never bother them.

Mr. Thornber: We take a peck of lime and four pounds of sulphur and mix it and wash the trees with that, and they never bother them.

SETTING LONG TOMATO PLANTS.—I plow a deep furrow and lay the plants down so as to allow about six inches to stand above ground. Cover, either with a hoe or plow. I have used plants 18 inches in length in this manner and had good success. I am never afraid of setting the plants too deep, as the roots which make the vine grow out from the stalk.

HOME EVAPORATION OF FRUITS AND VEGETABLES.—This summer I dried some strawberries, one quart of green fruit making about 2 oz. when dry. By pouring boiling water upon them and allowing to steep (not boil) for four or five minutes, they are almost as nice as when they come off the vines. Pumpkins, string beans, tomatoes and corn can be nicely dried and kept for winter use.

THE USES OF FLOWERS IN THE HOME.

MRS. ANNA B. UNDERWOOD, LAKE CITY.

Anything that will lend an additional charm to the home has an inestimable value. Life is too full of homely and prosaic but necessary routine not to take advantage of all that is wholesome, sweet and beautiful. It is greatly the habit among country folk to look upon flowers as a luxury, as trifling nonsense, foolishness and the care of them as so much wasted time; however, if once convinced of the refining, educational power of flowers, they will come to look upon them as a necessity, not a luxury. A love for flowers indicates a love for the beautiful; that love encourages tenderness and gentleness, and gentleness is refinement in the highest degree. A ten-year old lad, wishing to earn a little spending money, conceived the idea of selling some of the surplus of their garden truck. After his first day's experience, having met with fair results, as he was a winsome child, in a burst of confidence, relating the various incidents occurring to him, he said: "I tell you, I have learned just what houses to go to now. Of course, every one can't buy, but they ought to treat a fellow decently. I don't go any more to houses that have no flowers in the window, for the people in them say 'Get out! I don't want any of your stuff!' and slam the door in my face. But when I see flowers in the window of a house, there the people say 'Won't you come in and get warm?' and then they give me a chair by the fire and talk pleasantly, and even if they dont buy I have a good time."

With that lad, flowers and kindness were almost synonymous terms, and with him also the influence was continued through life, as manifested by a keen artistic taste and gentle, refined manners.

The fathers and sons are not so apt to exhibit love for flowers as the mothers and daughters. The reason for this lies in great measure with the mothers; for they allow their boys to drift away from the refining influence of these thoughts of nature, through lack of association. It is not necessary that a child be *forced* to cultivate flowers to develop a love for them; the very act of coercion is repellant and arouses an antagonism hard to allay. It is not that he has no love for the beauties, but he hates to be *driven*. Herein lies the great obstacle to general progression: human nature does not like to be driven, but it will submit to diplomatic coaxing and, unconsciously, perhaps, be led wherever reason dictates. So it can reasonably be said that flowers have a refining influence. Many mothers bewail the fact that their children are so destructive and wonder why it is so, and yet it is an every day occurrence for a mother to give her child a flower to pick to pieces just to keep it quiet while she can chat undisturbed with a friend. It appears a trifling incident; still, it is one of the many occasions given for the home education of the little ones. Beginning with the baby fingers, teach gentleness to inanimate as well as animate objects—the little ones are simply copies of those around—instil into their minds the fact that flowers have feeling and suffer from abuse.

Flowers also develop conversational powers and enlarge one's vocabulary of words. With a flower in hand, the holder thereof has the power of asking for or conferring knowledge. The mere act of

taking a beautiful flower between the fingers induces thought, offering it to a friend increases the thought force, which is soon manifested in speech. Perhaps, it is nothing but a pansy. Cannot the imagination picture the words as being loving and tender, mayhap full of reminiscenses of the past and of a friend who so loved the modest beauties, or expressing wonderment at the great potentiality of mother nature, which makes it possible for her to manifest *her* thoughts in such varied ways.

Flowers are so useful for home decoration. It is taken for granted that there is a well kept garden with the old time favorites, pansies, sweet peas, mignonette, etc., growing in it. During the summer have them in the house, not too many—save the great abundance for festive occasions—but have several *small* vases that will hold from one to half dozen flowers—it only takes a moment to fill such. Always have one for the center of the table in the dining room. Have a restless, uneasy child slip out in the morning while breakfast is preparing and get just *one* pansy for each member of the family, first instructing it to pick them so as to preserve each bead of dew intact—and lay it neatly on each napkin with a pin beside it. The little one is busied and pleasantly taught to work for others. At noon vary the decoration by a cluster of sweet peas or other seasonable flower. During winter, when flowers are scarce, a pretty plant for the center of the table and a green leaf from a rose geranium or nutmeg geranium or lemon verbena is fully as attractive, and the perfume so pervasive and sweet.

Flowers are so full of expression. Poets from the far away periods of the past, down to our own times, have without exception ascribed to flowers many and varied sentiments, so that by the skillful selection of a few a volume of thoughts may be indicated.

I wonder if there was ever a time when the father and mother experienced a tender feeling that induced the exchange of a bunch of flowers—maybe only one, but that one meaning so much. Was not the accompanying sensation delightful? Was it not followed by a pressure of hands—and perhaps (a vivid imagination suggests this) by a pressure of lips? Fathers and mothers, continue to be laddies and lassies; exchange the priceless gifts day by day. It cannot be done without a loving thought and word; and then aches will be forgotten, worries cast aside, the world be illuminated and heaven in reality with you. And at last these words of the gude wife will be possible: "We hae been mair than man and wife, we hae been sweethearts all the time!"

MY SHALLOW CULTIVATOR.—Last summer I felt the need of a fine-tooth cultivator, while plants were young and small, that would not throw earth. Having a wood frame cultivator in the barn laid aside for a more modern steel frame, I brought it down, took of the large teeth and having previously purchased two pounds of 60-penny wire spikes, I bored holes in the wood frame three inches apart and inserted the spikes and found I had a shallow cultivator that was a great punisher of small weeds and would not cover the plants.—[Ex.

THE SEEDLINGS OF 1897.

J. S. HARRIS, LA CRESCENT.

Eighteen hundred and ninety-seven is conceded to have been the poorest apple year we have known since the year of the Columbian Exposition. Except in a very few instances, the crop of the older grafted varieties was light, and the quality very poor, and in almost all instances the Russian varietes were equally unsatisfactory—and many of them have so far proved shy or moderate producers even in the most favored seasons. On the other hand many of our newer seedlings of northwestern origin and some of the older ones, like Patten's Greening, have produced very beautiful crops. The Wealthy and McMahon are no longer rated as seedlings, but the latter originated from seed produced in Wisconsin, and the former from Maine, but grown in our state, and both of them have done better with me than any variety of Russians, not excepting even the Duchess. I do not wish to be understood as going back on the Russians, for a great many of them are hardy, produce excellent fruit, bear reasonably well and will help us out until we secure something better; and they are bound to prove important factors in originating the apple we so earnestly desire, the tree of which shall be hardy, vigorous and productive and the fruit large, beautiful, of highest quality, and varieties fitting the season from July until July again, providing us with good apples the year round.

At the present stage of seedling production it is difficult to determine the future value of any particular variety, as varying seasons and different soils and location will give widely differing results. But it is easy to determine that through careless selection and breeding the great majority of them will prove worthless; some tender in tree, some lacking vigor, some bad blighters, and others bearing worthless fruit. All such should be destroyed at once and their fruit never again seen upon our exhibition tables, while all that are reasonably promising should be tested as soon as possible in different localities, so that their worth may quickly be known. Those who attended the last state fair will agree with me that seedling production is growing in interest and importance, and that the outlook for the future is assuming hopeful proportions. In Horticultural Hall, there was one long table upon which was shown over three hundred varieties, and a considerable number of them compared favorably with older varieties in quality and appearance. Leading exhibitors of large collections of seedling apples and hybrids were, D. F. Akin, of Farmington; H. M. Lyman, of Excelsior; J. R. Cummins, of Eden Prairie; T. Lightly, of Austin; H. C. Decker, of Dresbach; The Jewell Nursery Co., of Lake City; J. A. Howard, of Hammond; M. Pearce, of Chowen; Ditus Day, of Farmington, and others; while a number of other parties showed single plates. Mr. Akin's collection was very extensive and contained many varieties of fine quality. All of the collections had varieties that showed up well with the old grafted sorts.

The exhibit by Mr. Lightly was of fruit grown on seedlings procured from Peter M. Gideon. They were all of most beautiful appearance, and about twenty varieties would average from a little

under to full medium size. Taken as a whole, it was the best result thus far obtained from seedlings sent out by Mr. Gideon. They are supposed to have been produced largely from hybrid Siberian seeds crossed with Wealthy, Duchess and other apples, and are a wonderful revelation of what may be expected from planting seeds of the best of these hybrids, etc., crossed with some of the hardiest and best long keeping apples grown far north. Several of these will keep well into the winter.

Of crabs and hybrids produced on trees from the same source, J. C. Kramer had the largest and best collection, followed closely by Messrs. Cummins and Decker. Like Mr. Lightly's their trees bear heavily, while trees of older varieties were nearly barren.

The first premium for winter seedlings was awarded to J. A. Howard, on a sweet apple. Size 4; weight 4½ oz.; roundish conical; light greenish yellow; flesh, yellowish white, fine grained, firm; quality, good; season, winter.

A fine seedling was shown by Mr. Lyman, that escaped the notice of the committee. Size 5; weight 5 oz.; smooth, roundish; yellowish green, with brown blush cheeks; flesh, yellowish, nearly fine, firm; subacid flavor, good, season. winter. Kite's seedling, by Mr. Cummings, was a good and beautiful little apple, suitable for desert. Many fine seedlings were shown by the Jewell Nursery Company.

THE PLUM POCKET.

THOS. FRANKLAND, STONEWALL, MANITOBA.

During the season of 1897 observations were made here on the plum pocket, as follows:

Well developed seed germs were found enclosed in three-fourths of those examined and a skinlike substance around each seed germ, the first formation of the stone in a perfect plum pit. The skin of the ovary on the outside receiving its nutriment, as I suppose, from the air, at first showed natural green and quickly developed into the size and color of the perfect plum; on the inside, in place of pulp, was a ragged, pithlike substance and apparently torn and tattered sap vessels (?), dry and dusty at maturity, in place of juicy pulp.

Now, as the seed surrounded by or enclosed in the embryo stone was *entirely loose* and disconnected from the rest, and as *invariably* plum pockets are formed after two or three nights of frost when most of the flowers have been fertilized, can it be possible that plum pockets are caused by contraction and expansion, causing the bursting or separation of the sap cells? If fungous growth then takes place, is it not similar to *mortification* in animal and rot in vegetable substances?

Has any one used any fungicide that has had any effect in preventing plum pocket? Can plum pocket be developed from spores (if there be any)? Several specimens I found where half of the plum was hollow like the pocket and the other half developed sound, solid pulp; but these did not ripen.

Please have this thoroughly discussed.

THE MUSHROOM AS A FOOD.

DR. MARY S. WHETSTONE, MINNEAPOLIS.

The eating of fungi is ancient in origin and is mentioned in the most ancient writings of civilized people. One of these writers declares that "Boleti were so exquisite that it was not safe to send them anywhere by a messenger, for he would be sure to eat them by the way. You might send silver or gold but not boleti." Pliny had a great deal to say about fungi, even to directions for cooking them. Ancient Greeks extolled their favorite fungi as "food of the gods."

In Italy, France, Germany and Russia, they may be called the "manna of the poor." In their markets I saw bushels of them exposed for sale as commonly as potatoes are here. In some of the large cities inspectors examine them that no injurious species are accidently admitted. In Russia they form the most important food of the common people. Tolstoi makes mention of them as one of the articles in his diet. In Poland whole tribes are supported by them, scarcely any species but the dung and fly agarics being rejected. Some that are rejected elsewhere as being unwholesome or poisonous, they dry or pickle in salt or vinegar for winter use; this process is said to destroy their poisonous properties. A gentleman while confined in a Polish prison, to amuse himself gathered and dried kinds found growing inside its walls, some of which were reported to be dangerous. When the soldiers found them, he was surprised to see them eat all of them. Dried morels are sold for food in western India, China and Japan.

In 1837 the Roman authorities made a law, requiring all mushrooms exposed for sale in lots above ten pounds, to be inspected and taxed. During a term of ten years they averaged from 60,000 to 80,000 pounds yearly. This did not include those gathered for private use or those dried, pickled or preserved, &c. If such a large amount was consumed in one city of Italy, what must have been the aggregate amount used in all Italy?

It is stated that the Chinese government publishes a work of five volumes, with plates, entitled "Anti-Famine Herbel." It contains descriptions of 414 different plants, whose leaves, rinds, stalks or roots are fitted to furnish food for the people when by any means ordinary food is made scarce. Thousands of copies are printed annually and distributed gratuitously in the localities where most needed.

In various countries of South America, fungi are eaten. In Terre del Fuego mushrooms are the staple food for several months; one kind growing on beech trees is called "summer fruit." Throughout South Africa and the islands of the ocean, they are consumed by the natives. So far as I can learn, they are partaken of by every known nation on the face of the globe.

In the United States this is a neglected article of the vegetable kingdom. Our lawns, fields, pastures and woods teem with the richest of nature's fruits. It seems a pity that our country people should depend upon fried salt pork for daily diet when about their doors are growing such an abundance of fungi, such delicious,

wholesome and nourishing animal food, for gastronomically and chemically considered the flesh of the mushroom has been proved to be almost identical with meat, and possesses the same nourishing properties.

During the late civil war the people in the southern states, being pressed for food, gathered and ate fungi.

A few fungi are endowed with medical properties. Ergot, a most valuable medicine, used to control hemorrhage, is made from a fungi which grows on rye.

Profs. Lugger and Green can tell you of numerous kinds that are enemies to your grain and fruits, but we shall only dwell on those used as a food. They exist in vast profusion everywhere and only need to be known to be utilized or avoided.

Fries, the father of the study of this class of plants, discovered 2,000 species within the compass of a square furlong in Sweden. Rev. M. A. Curtis, of North Carolina, in his catalogue of the flora of that state, gives a list of 2,391 fungi. Within two miles of his residence, he designated 111 species of mushrooms, forty of which he had eaten. Dr. A. E. Johnson collected and determined 775 different species of fungi, 14 of which were new to science. These he found in Wright, Anoka, Hennepin and Ramsey counties. A general knowledge of the mushroom would add enormously to the food supply of our country.

The question which every one asks first is, "How can you tell a toadstool from a mushroom?" You cannot tell mushrooms from toadstools, because toadstools are mushrooms. What they really wish to know is, how can you tell an edible from a poisonous fungus? Of this our knowledge is empirical. We know that certain species are edible and others are poisonous, because persons have eaten the former and found them good and harmless, and others disagreeable and harmful.

W. H. Gibson writes: "You will find various popular traditions and tests given for selection of mushrooms, which are not worthy of consideration, such as the following: "Pleasant taste and odor; boiling with a silver spoon, the staining of the silver indicating danger; peeling of the cap; change of color in fracture." He adds: "I once knew an aged dame who was a village oracle on this as well as other topics, and who ate and dispensed toadstools on the above rules. Strange to say, she lived to a good old age and no increased mortality chanced as a result of her generosity."

As a rule, the people of the United States are not often fungi eaters, largely owing to a dread of being poisoned. Yet there certainly are not as many cases of mushroom poisoning as of canned meat and sausage. So commonly is unwholesome meat offered for sale that, for the protection of consumers, inspectors have been appointed. Still, instances of poisoning are reported from time to time. Last Sunday, in Minneapolis, three members of a family were poisoned by eating beefsteak. We do not presume that the knowledge of such cases will deter any from eating meat in the future. There can be no universal rule given for detecting the poisonous mushrooms.

Prof. Farlow, of Harvard college, gives the following to guide us, in our selection:

1. Avoid collecting fungi in the button stage, since in their unexpanded condition poisonous specimens may be easily mistaken for edible species.

2. Avoid all fungi which have around the base of the stalk a cup, sacklike or scaly envelope.

3. Avoid all fungi having a milky juice, unless the milk is reddish.

4. Avoid all fungi in which the cap is thin in proportion to the gills and in which the gills are nearly of equal length, especially if the cap is bright colored.

5. Avoid all tube-bearing fungi in which the flesh changes color when cut or broken, or where the mouths of the tubes are reddish.

6. Never eat fungi of any kind in which the flesh has began to decay slightly.

There are about a dozen well known species that are described by nearly all writers on the mushroom which may readily be recognized by their description—same as other fruit. Once you begin to study and compare, you will be surprised and delighted to find it is not difficult to recognize them. The harmful ones are the exception. But in no case eat one unless you are positive that it is edible. One of our specialists on mushrooms recommends the following for determining whether one is edible. First chew a bit, spit it out, next day if no unfavorable symptoms appear chew and swallow a bit; third day swallow a larger piece. By fourth day if no unpleasant symptoms have developed, eat a whole one, after which, if no bad effects follow it may be considered edible.

At one time I was in doubt about the advisability of a certain mushroom. When the servant saw it she remarked: "Our cows used to eat those." Then I ventured to eat it also. The domestic animals are fond of some kinds of fungi.

Some cultivated in the greenhouses are constantly exposed for sale and command 35 cents to 50 cents per pound. Here is a commercial hint for you who have cold cellars and greenhouses.

There is a growing demand for literature on the mushroom. In 1891-92-93-94, the United States Department of Agriculture issued four excellent bulletins with colored plates, and those of you who received and have preserved them have excellent helps in distinguishing some of the common edible and poisonous kinds.

In most of our cities, particularly in the east, mycological clubs are formed for the study of fungi. I trust that we shall do likewise. Such clubs would undoubtedly afford much pleasure and profit. A few books and pamphlets might be purchased as a reference library at a trifling expense to each member and kept at one place. Here each could take specimens and interchange knowledge and opinions, and some would soon be experts.

To facilitate study along this line, I have taken pains to learn what literature is available for very slight expense, and I am able to pre-

sent the following, beginning with those that may be had free by simply applying for them:

"Observations on Mushrooms," Circular 13, revised edition, United States Department of Agriculture.

"How to Grow Mushrooms," Farmer's Bulletin, No. 53, United States Department of Agricultue.

Year Book, 1897, Department of Agriculture, contains a most excellent article on mushrooms by Prof. Farlow, of Harvard college; price 50 cents. Cornell University (Ithaca, N. Y.) has begun to publish a series of bulletins on the mushroom, The first, No. 138, is out and can be had by applying for it.

Chas. H. Peck, New York state botanist, under the auspices of the board of regents of the university has published considerable on the mushroom. His forty-eighth annual report, of 1895, is the best for the money that I know of. It contains forty-nine colored plates with elaborate descriptions. It can be had for the small sum of $1 by applying to the State Librarian, Albany, N. Y.

In Minneapolis and Saint Paul public libraries and in the historical library at the capitol, you will find excellent popular and scientific books on fungi. I might name other works, but if you desire more literature on the mushroom, send to the United States Department of Agriculture for Library Bulletin No. 20, which gives a list of hundreds of publications on fungi.

If you wish to study them scientifically, you will wish to get Cook's Introduction to the Study or Massee's works.

I sincerely trust that each one of you will send for one or more books and begin the study of this most excellent article of food, growing at your doors. I can promise you that besides adding a delicious article to your bill of fare you will have a delightful and exhilerating pastime.

WOMEN'S AUXILIARY TO THE MINN. STATE HORT. SOCIETY.

(Organized at the summer meeting of the Horticultural Society, June 25, 1896)

LUCIA E. DANFORTH, SECY., RED WING.

A meeting of the women present was called in Prof. Green's lecture room at 11 o'clock. Pres. J. M. Underwood, of the Horticultural Society, called the meeting to order and asked Mrs. J. M. Underwood to state the object of the meeting. It was, in brief, to organize the women of horticultural families to work through the State Horticultural Society and also through the State Federation of Women's Clubs, in village and country improvement, beautifying country school yards, and developing in all possible ways the artistic side of rural life. Miss Emma V. White was elected temporary chairman and Miss Lucia E. Danforth temporary secretary. Officers were elected as follows:

President—Miss Emma V. White, 824 Nicollet ave., Minneapolis.
Vice President—Mrs. Anna B. Underwood, Lake City.
Secretary—Miss Lucia E. Danforth, Red Wing.
Treasurer—Mrs. L. R. Moyer, Montevideo.

There were added, as members (with the officers) of the executive committee, Mrs. J. R. Cummins, Eden Prairie; Miss Emma E. Grimes, 3209 Nicollet ave., Minneapolis; Dr. Mary S. Whetstone, 506 Nicollet ave., Minneapolis.

Voted, that Mrs. Underwood be our delegate to the convention of the Women's Clubs of Minnesota in Winona next October, and that she be empowered to appoint a second delegate if our numbers permit.

Voted, that the executive committee draw up a constitution to be presented at the time of the next meeting of the State Horticultural Society.

Ladies were requested to give their names to the secretary, and nineteen joined at once. An annual fee of twenty-five cents was decided upon. All ladies interested in horticulture, whether members of the State Horticultural Society or not, are urgently requested to unite with us in this work, and send their names and fee to the secretary.

Adjourned.

EMMA V. WHITE, President.

LUCIA E. DANFORTH, Secretary.

FRUIT IN MILLE LACS COUNTY.

D. H. ROBBINS, VINELAND.

(A Communication.)

Your suggestion that I write a report of what I have been trying to do in the shape of fruit raising up here at Mille Lacs Lake, and its results, knocks me way over the fence. Writing reports is entirely outside of my accomplishments, yet I can give you a few pointers as to what I think can be done up here by any one who has the time and desire to try. Here where I am located, at the southwest corner of the lake, wild fruit, such as plums of several varieties and wild plums, are very abundant. Two years ago I sent to the Lake City nursery and obtained a variety of scions to graft in the wild plum trees upon my place, to see what they would amount to. I grafted 200 trees. Eighty per cent. of them proved a success, and some of them today are about an inch in diameter; some of them flowered last spring but I picked them off. I expect they will bear to some extent this year. I feel so elated over my experiment I shall graft several more this spring, and also graft in some varieties of hardy cherries. I planted five years ago fifty apple trees of different kinds, of which about twenty-five are bearing more or less nicely; the others were killed by rabbits girdling them. Several parties have experimented with apples on the west shore of the lake. Messrs. Jabies and Hazelton have a number of fine bearing apples of a large variety. Although I have a growth of currants and gooseberries, it is unnecessary to try to raise small fruits, as berries, such as red and black raspberries, blackberries, huckleberries, or blueberries, generally grow here wild in such an abundance that they are almost a nuisance. The small sweet black cherry grow also in abundance, but the birds claim them as their share of the good things as fast as they ripen. Juneberry trees and the wild high cranberry are also very plentiful, and every section of land within miles of here has at least one cranberry bog upon it. Consequently, the settlers here do not have to trouble themselves to raise small fruits, for from the time strawberries come in June (and they can be found in abundance in every opening) until frost comes in September, the settler can find small fruits in abundance near his home and in their season. The only question that bothers them is to obtain the necessary sweetening to preserve them. Your proposition in regard to supplying the schools with the society reports meets my favor, and I think it a good one.

PARK AND OUT-DOOR ART ASSOCIATION.

(Report of Annual Meeting.)

F. H. NUTTER, MINNEAPOLIS.

The second annual meeting of The Park and Out-Door Art Association was held in Minneapolis June 22nd to 25th, 1898, most of the sessions being held at the West Hotel. The attendance was gratifying to those interested in the welfare of the society, and different sections of the country were well represented, members being present from Boston, New York, Cleveland, Detroit, Chicago, Omaha, Kansas City, New Orleans, and many other of the principal cities and towns, with, of course, a numerous delegation from the "Twin Cities."

In the absence of the president, John B. Castleman, of Louisville, Ky., who is now in active service in the army, the meetings were most pleasantly presided over by Vice-President L. E. Holden, of Cleveland, Ohio, while the secretary and treasurer, Warren H. Manning, of Boston, was untiring in his efforts for the success of the meetings. It is pleasant to note that the labors of these officers, not only during the convention but also through the year just past, in inaugurating the society on so firm a foundation, were fully appreciated and recognized by those present.

The first session convened at 10 a m. on Wednesday, when our visitors were formally welcomed by Mayor Pratt, of Minneapolis, in a few earnest words in recognition of the part that their work had in improving the conditions of our cities and homes, to which the chairman fittingly responded.

The papers presented at this first day's sessions were as follows: "Playgrounds and Public Squares," by Pres. W. W. Folwell, of the Minneapolis Park Commissioners, in which he treated principally the first division of his subject, setting forth the important part that association with nature and an opportunity for proper out-door exercise had in developing not only the physical but also the mental and moral characters of our children and youth.

"Appreciation of Natural Beauty," by O. C. Simonds, of Chicago, Ill., and "Suburban Home Grounds," by Chas. N. Lowrie, of New York, proved that the landscape architects of today are not the blind devotees of the artificial that many of the self-claimed admirers of nature would have us believe, but in reality, doubtless, have a deeper appreciation of the true beauties of nature than many of their detractors.

At 4 p. m, chartered cars took the visitors and their hosts to Minnehaha, where some time was spent in viewing the falls and wandering through the glens and woods.

The evening session was held at the Unitarian Church, and was to a certain extent under the auspices of the Ladies' Improvement League of Minneapolis. Mrs. Robert Pratt read a paper setting forth the past successful work of the league, which was followed by a paper on "The Influence of Parks on the Character of Children," prepared by the veteran landscape gardener, H. W. S. Cleveland, and read by his life long friend, Hon. C. M. Loring. A letter from the sec-

retary of the New York Association for the Improvement of the Poor, telling of the work being done there, was read by Mrs. Dr. Force. The closing number and, doubtless, from the popular side the most interesting of the week was presented by Mr. Shuey, of Dayton, Ohio, and told of the work done by the officers of the National Cash Register Co., of that city, in improving the suburb where their factory is located, and with the hearty co-operation of their employees, making it, in effect, a residence park. Many fine stereopticon views showed the situation both "before and after taking" and were a revelation not only to the landscape gardener but also to the political economist. It is to be regretted that the attendance at this meeting was not larger, and many hopes were expressed that Mr. Shuey might be heard again in this city under more favorable circumstances.

Thursday, at 9 a. m., tally-hos and other carriages were on hand for a trip through some of our parks and parkways and around the lakes, which was much enjoyed, notwithstanding the extreme heat, 94°.

In the afternoon matters of business were taken up, and papers read bearing upon park work, the most interesting being "The Duties of Park Commissioners," by President Christian Wahl, of the Milwaukee Park Board, and "Plant Propagation for Parks," by Fred Kaust, gardener of the South Parks, Chicago, Ill.

At 5 p. m. the ladies of the Minneapolis Improvement League tendered a reception at the home of Mrs. H. F. Brown, and at 8 p. m. a banquet was given by the City of Minneapolis, at the West Hotel, which was participated in by about 100 guests and was a delightful occasion, closing with some interesting and appropriate speeches, Pres. W. W. Folwell acting as toast-master.

Friday morning brought the closing session of the meeting, and on account of business matters the papers on the program were filed for printing.

The constitution and by-laws presented by the committee on organization caused some discussion, and there were some who wished to confine the organization more closely to park officials, but in view of the fact that many of the most active members of the association were not such officials, and those that were were by no means sure of their tenure of office, this view did not prevail.

In the choice of officers for the ensuing year, Minneapolis was honored by the election of Hon. C. M. Loring as president of the association.

The usual resolutions of thanks for courtesies extended were adopted, also one fully endorsing the proposed interstate park at the Dalles of the St. Croix, which latter was based on personal examination of the locality, made by many of the members before or during the meeting.

At noon cars were taken for Como Park, St. Paul, where the park commissioners of that city tendered a banquet at the Pavilion which was eaten to music from the First Regiment band; after

which carriages took the party through Como Park, thence by way of Summit avenue to the delightful outlook at Indian Mound Park. Minneapolis was reached again about 7 p. m., and farewells were spoken by many of the visitors who were obliged to hurry to their distant homes, though quite a number were able to participate in the excursions arranged for Saturday to Lake Minnetonka or to the summer meeting of the State Horticultural Society at St. Anthony Park.

The next annual meeting of the association will be held at Detroit, Mich.

A REVIEW OF APPLE BLIGHT.

CLARENCE WEDGE, ALBERT LEA.

All of our horticulturists will readily agree that blight is the most destructive as well as the most insidious and erratic of all the orchard diseases that infest this region. So far as we can learn, it was for some years almost unknown among the early orchards of Minnesota, and some of the orchards of Manitoba seem as yet to have escaped its visitation. As a persistent enemy of pear culture, it has long been known in the eastern states, but in that section it is seldom or never severely injurious to the apple, and it is only as we approach the dryer and colder portion of the Mississippi valley, that the disease becomes generally fatal to the pear and seriously injurious to the apple.

While our varieties of the apple and crab differ widely in their susceptibility to its attack, it is folly for any one to state that any variety is "blight proof," as all known varieties of the apple and pear, as well as the native crab, thorn apple, and mountain ash, are known to have been affected by it.

From its nature as a microscopic plant, living within the tissues of the tree and propagated by spores that float in the air, it is and in all probability will be an exceedingly difficult disease to meet with any effective and practical remedy. To attempt to combat it with any spray or wash, such as is used for aphis, scab or like enemies that work upon the surface of bark, leaf or fruit, would evidently be an utterly futile and absurd method of reaching a disease whose first visible symtoms show that it has already fastened itself upon the hidden tissues of the plant. We have heard of so many remedies, some of them verging upon the superstitious, proposed for this disease by those utterly ignorant of its nature and based upon the most slender experience and doubtful results, that we wish to say emphatically that any practical remedy that promises a reasonable mitigation of its ravages will be heralded by the scientific world as a discovery rivaling the work of the immortal Pasteur, and that when we have effectively circumvented the visible and tangible curculio, gouger, aphis, leaf hopper and mosquito the time may be ripe for active efforts to discover a "cure all" for the blight.

A reasonable care when choosing the varieties and location of the orchard is the best and only way of avoiding loss from this disease that is known today or likely to be known for many years to come In low, sheltered locations, especially in alluvial subsoils, our best varieties will occasionally suffer severely. On high, airy locations with clay or limestone subsoils, and on the cool northern slopes, some bad blighters may be tolerated and prove reasonably healthy and profitable. But in a section so favorable to the development of blight as the greater share of Minnesota, its sporiferous nature and the fact that one unhealthy individual is continually harboring and giving out the contagion and in blighting years is very likely to be the center of severe damage, should never be forgotton.

The apple and crab list recommended by our society contains nothing but what resists blight to a reasonable degree, but among them the following may be said to be exceptionally free. Duchess, Patten's Greening, Okabena, Peerless, Anisim, Christmas, Virginia, Minnesota and Briar Sweet.

Blighting kinds that, like the Yellow Transparent or Antonovka, are especially desirable from their extreme earliness or good qnality of fruit, need not be altogether discarded but should be planted in a separate orchard at a distance from the main orchard.

In closing, permit a few words of caution: Do not condemn a variety because for one season it has blighted severely with you and in your vicinity. Our best varieties occasionally do so.

Do not condemn a variety because it has blighted to death as a very young tree; the same amount of blight on a large tree would scarcely be noticed.

Do not sound forth your fine new seedling or promising new variety as blight proof because it has stood well in your own orchard while other kinds were injured. Many of our meanest blighters are standing here and there in just that deceptive fashion.

And, finally, do not plant a pear of any kind in Minnesota soil, unless you are duly fortified in spirit, and callous of heart; for, however healthy it may be as a young tree as soon and as surely as it approaches maturity and puts forth its first generous effort to repay your care, will it fall an easy and complete victim to this its ancient and hereditary foe.

Mr. Gibbs: I have believed for a great many years that in setting out an orchard of trees of varieties which are known as blighters—those trees that blight when standing by themselves, like the Transcendant—if put in a favorable position, preferably on an elevation, there need not be much trouble with the blight, and my experience in the last twelve years has confirmed that theory. I have not time to discuss the question fully. I did not have any trouble with the Yellow Transparant, and I should put it No. 1 in my list of planting in a good situation.

PLUMS OF THE VILLAGE LOT.

LYCURGUS R. MOYER, MONTEVIDEO.

During one of the grasshopper years in the early seventies, I was examining railroad land in southwestern Minnesota for a railroad company. My work brought me to what is known as Dutch Charley's Creek, in Cottonwood County, late in the afternoon of a beautiful day in early autumn. The surrounding country had been settled before the Indian outbreak of 1862, but had been twice depopulated, once by the Indians who had driven out the settlers and again by the grasshoppers. A thicket of native plums had ripened its fruit unmolested in the creek valley, where it was discovered by our surveying party. The fruit, as I said, had ripened unmolested, and it was fully matured. I need not say that the plums disappeared as if by magic before the hungry surveyors. To this day the remembrance of the fine flavor of that particular fruit is a fragrant and precious memory.

The next year I married and determined to settle down on a village lot, and I thought it would be well to reproduce, if I could, a plum thicket similar to the one I found on Dutch Charley's Creek. I recalled the fact that I had once eaten fine plums gathered in a thicket on the Chippewa river near our place. I found that the trees had grown old in that particular thicket, but by dint of hard work I was enabled to remove a few small trees to the garden. The plantation was successful, and we were rewarded with fine fruit. Had we been wealthier—or wiser—we would have bought grafted trees of improved varieties. We afterwards did make a plantation of the better varieties, and this season the Wyants began to bear. We call the Wyant a success on the village lot. We mulch the trees well, but we cultivate them too. On our high, dry bluff we often get plums when the crop fails in the valley from unseasonable weather.

One beauty of the plum tree for the village lot is that it bears crowding and, in fact, rather seems to enjoy it. You can plant a large number a plum trees in a small space and seemingly get better crops.

We have sprayed our trees with Bordeaux mixture for curculio and with kerosene emulsion for aphis, but the plum has one enemy that we have found exceedingly hard to manage. I refer to the village boy. We have surrounded the village lot with a Page fence, such as they use to confine wild animals for a game preserve, and have added a barbed wire on top of that, but the small boy gets there just the same. Perhaps he deserves the plums. When the bright golden days of the future come, of which the poets have dreamed, there will be a plum patch in every village lot, and the village boy will not have to visit the neighbor's orchard to get the fruit that belongs to him as a matter of right.

Plant plums and give the small boy a chance at home.

RED RASPBERRIES IN MINNESOTA.

WM. LYONS, MINNEAPOLIS.

I will give my plan for the cultivation of the red raspberry, not as authority but for what you may consider it worth. I shall refer to field culture. The rows should be about six feet apart, and the plants about three feet apart in the row. If planted further apart than this, the canes grow too strong and are liable to break when laying them down for winter protection.

Red raspberries may be planted either in the fall or spring; I prefer fall planting. When ready to plant, I mark the ground three feet by six feet. The wide rows are opened with a shovel plow; then at the cross sections set the plants. This open furrow gives a good chance to spread out the roots of good one-year-old rooted cuttings; suckers, such as are usually used, can be planted much more easily, because having no fibrous roots. A hole is made with a spade, they are dropped in, and the ground firmed around them.

There is but little to do the first year except to keep them clean. A row of potatoes or cabbages can be planted between the rows the first and second years. When the plants are about twenty inches high, nip the tops off, which will cause them to branch out at that height, and they will be self supporting. I never use stakes or wire for the red raspberry.

Raspberries can be grown after the first year with less work than potatoes, and by manuring and cultivating the plantation can be kept bearing for several years without renewing. They are adapted to almost all soils. Allow five or six canes to the plant, and treat all the rest like weeds. The second year pinch or cut the tops off when about three feet high.

Hansel, Turner, Cuthbert and Marlboro are the kinds mostly grown for the Minneapolis market. Cuthbert and Hansel are so badly affected with "curled leaf" that in some sections their cultivation will be discontinued. It is fortunate for us that several new varieties now being introduced will take their places, namely, the Loudon, King, Miller's Red and Thompson's Early Prolific. Shaffer's Colossal is a splendid berry (except for its color) and a vigorous grower. Some of the berries are monsters in size, averaging seven-eighths of an inch in diameter. It is about the same in quality as the Philadelphia, which we had to discard on account of its dark color. The Columbian is another new berry, claimed to be superior and larger than the Shaffer, of which it is about the same type and color. It propagates readily from the tips and never suckers from the root. It is a very promising variety for canning. Some think it is the best raspberry in cultivation when grown on rich, strong soil. It is very difficult to give it winter protection, the canes are so strong and woody. On poor soil it is more easily taken care of.

In this state, to insure a crop, it is necessary to lay down and cover in the fall. Some hardy varieties, such as the Turner, will do fairly well without winter protection, but they will do better with it. I put off laying them down as long as I can, but still get them down

before the ground freezes. I like to have a frost stop the growth of the cane and start the leaves falling before I begin to lay them down. The first thing necessary is to cut out the old canes, if that has not already been done. A sharp spade or grass sickle are good tools with which to cut out the old canes. After they are trimmed and cut out, I have a piece of plank about four feet long with four iron pins in it about fifteen inches long. Two handles and shafts are bolted onto it. It is drawn by one horse, and the old canes are gathered into bunches by the use of this implement very quickly and hauled away by wagon. I found this the quickest and cheapest way to get rid of the old canes. Any one can make it, as it is not patented.

For digging under the side of the hill and also for covering, I prefer a round-pointed, long-handled shovel. Dig under the side of the hill, taking out a good shovelful of earth. I prefer to treat a number of rows in this way before laying them down, two working with shovels and one with a four-tined fork. Let the one with the fork take his position on the opposite side of the hill from which the earth was taken and gather the canes in his fork by placing it against the hill near the ground and raising it about three feet; then with one foot against the crown of the plant close to the ground press from him with both fork and foot, bending the canes to the ground and holding them till enough of earth is thrown upon them to keep them in place. Three men can lay down and cover about half an acre a day. In the spring when the ground thaws out, straighten up the plants to an erect position. Shallow cultivation, say once a week, should be continued to the end of the picking season.

Now, to grow root cuttings. Late in the fall I plow a few furrows between the rows and with a fork take out all the roots I think I shall need, made a pile of them and cover with earth where they will remain frozen all winter. In the spring I select a piece of good ground and, with a single-shovel plow, mark rows about three feet, apart. I then cut the roots about three or four inches long, drop and cover them about three inches, cultivate and keep free from weeds. In the fall they wi l be from two to four feet high, strong healthy, well rooted plants.

To the young man or new beginner, I would urge the importance of starting correctly and properly in a small way and then increase only as knowledge and demand present themselves. Energy, patience and perseverance are necessary qualifications for a successful fruit grower. Location and soil is also a very important factor in the small fruit business and must by no means be ignored. As a rule, the highest grounds are most desirable, for the reason that late frosts in the spring are less injurious to the young shoots and blossoms, which are so often killed on low ground. Avoid too many varieties. To the market grower I would say, examine the plantations in your vicinity on similar soil and locations; note down the smallest possible number of varieties in each class of fruit you propose to grow in order to make a succession and meet the wants and tastes of the market where you will sell.

(A long discussion on this paper will appear in August number.—SECY.)

NOMENCLATUE AND CATALOGUE.

J. S. HARRIS, LA CRESCENT, COMMITTEE.

Your committee have not found as much work to be done in the past year as in some years before. Occasional specimens have been sent to us for identification by individuals, and the true name when known has been given to them direct, instead of making it a matter of report to this society. Very frequently the name has been widely different from that by which the trees were originally purchased of nurserymen or agents. At the late state fair we found occasion to make corrections in a few of the exhibits but rarely among the leading varieties and have kept no record of them. We are pleased to note that there is much less confusion among the names of American varieties than there was a few years since, but acknowledge that we are making but slow progress in arriving at the correct nomenclature of many of the new Russians and are of the belief that a number of the names under which they have been sent out are only synonyms. If not different members of families or types, many of them are so nearly alike in tree and fruit that we think it will be best to recognize only two or three of the best of each type as the Oldenburgs, Hibernals and Transparents.

We suggest that Greening be dropped from the Patten's Greening and that it hereafter be known as "Patten," and also that in other cases where secondary words are used that are not necessary to insure identity they be eliminated. We further recommend that whenever a seedling variety is awarded a first or second premium either as a fall or winter apple or a Siberian hybrid, it shall be given a suitable name and described as accurately as possible and its history, place of origin and originator's address, together with the name of the variety from which it sprang, if known, be placed on record. And we further suggest that all parties that have seedlings of promise of value for hardiness of trees, productiveness or superior quality of fruit be requested to furnish the committee on nomenclature or seedling fruits with samples of the same for the purpose of having descriptions made, together with history of the tree, to be preserved for future use.

The last full catalogue of such varieties as are usually shown at our fairs or are grown in some portions of the state or are offered for sale by agents and nurserymen, was published in the Report for 1893. We think that the catalogue should be revised, corrected, a few more varieties added to it, and be published again in the near future. This might be done by a committee and then submitted to the society for adoption. Its publication would use about ten pages of our report. The catalogue of fruits recommended for cultivation in the various sections of the United States by the American Pomological Society, has recently been published in a bulletin by the United States Department of Agriculture, and is very valuable for reference. Your committee furnished the starring (*) for the state (10th district), but as the district includes Wisconsin west of 89th meridian and Iowa north of latitude 42 and Minnesota, some varieties not grown here have a star. Among them are the Baltimore, Hightop Sweet, Jewett's Red, Kirkbridge, Northwestern Greening, Pewaukee, Twenty-Ounce, Wagner and Windsor, and several of the others are grown only in the most favored localities. The plan of the catalogue is excellent, and a good one for individual states or societies to follow. We further advise the making of a map of the state and division into districts and starring the catalogue by districts.

Calendar for July.

PROF. S. B. GREEN, ST. ANTHONY PARK.

At this season of the year it seems to me that about the most important general thought in connection with horticultural work is to keep all the plants growing rapidly. To accomplish this to the best advantage it is necessary to keep the soil well stirred and keep the foliage free from disease and insects. This is true of all plants, but in our fruit garden it is especially true of gooseberries, currants and, in fact, all our small fruits. Too often after we have gathered a good crop of gooseberries or currants, we are perfectly willing to let the bushes take care of themselves and struggle as best they can with the weeds and insects; but in order to get a good crop of fruit next year we should consider that it is absolutely necessary to have a crop of good, well ripened wood this year.

The growth of most of our hardy plants has now pretty generally ceased, the terminal bud is formed on the new branches, and the ripening process is going on. This ripening process largely consists of storing up of food in the buds, wood and roots of the plants. The first of this month is a good time to cut the brush, since when cut at this season it is least liable to sprout, for the reason that the roots have very little food stored up which they can use in starting new growth.

The renewing of strawberry beds will soon call for attention, and the recent rains have put the ground into such condition that this work should be very successful. Where the beds are weak, it probably will not pay to renew them, but where they are strong and have borne a good crop of fruit I think it very foolish to plow them under, since the work of renewing the beds is very little, and it is just as well to take two or three crops of strawberries off of a bed as one. We have tried a number of different implements in renewing our beds. We have sometimes used the disc harrow after taking off the two inner discs so that there will be a space of about sixteen or eighteen inches between the inner discs, but I think that the common two-horse corn cultivator about as satisfactory as any implement we have used for this purpose. By driving over the rows a few times it is a very simple matter to loosen up the soil and to cut the rows of plants down to a width of about sixteen inches. But, first of all, we mow the beds off clean, and if the weather is right so

that we can get the leaves very dry we generally burn the bed over, but if the material is somewhat moist so that it will burn slowly this is rather a dangerous thing to do, as it is liable to kill out the plants in spots.

After burning and cultivating, it is my custom to allow the plants to start and then thin out the weaker ones and cut out the weeds, leaving the plants about six inches apart each way in the row. From this time the treatment is the same as accorded to new beds, and it often happens that we get as good results from the old beds renewed as from the new beds, and sometimes even better. Unless the soil is very rich a good coating of well rotted stable manure should be applied at the time of first cultivating.

The budding of plums, roses, apples, etc., can be done this month. In case of plums it is generally desirable to do it by the 15th of the month, since they stop growing rather early. The process of budding is a very simple one, far more simple than grafting, and people generally should be more familiar with it. Most of our cultivated roses are easily budded upon our native stocks and make a very satisfactory growth. Apples are also quite easily top-worked in this way.

It is very likely that we shall have a drouth from the middle to the latter part of this month, and if such is the case it is well to remember that in watering plants of any kind one good watering is better than a number of light ones, and the place to put the water is at the roots and not on the top of the plants. Newly planted trees are especially liable to injury from drought, and if there is liability from this source they should be heavily watered, the soil then mulched or kept thoroughly cultivated and covered with a good dust blanket.

In the vegetable garden, we can continue planting cabbage for a little while yet, providing we are using rather early varieties. It is time to plant celery for late use. String beans, winter radishes, ruta bagas can be sown for autumn or winter use.

This month we should have early potatoes, string beans, cabbage, summer squash, cucumbers, green corn, onions from sets and cauliflower, in addition to the vegetables which were nearing maturity last month.

Among the pretty hardy things that are especially interesting at this time are, among the light foliage trees, the Royal Willow and the European Olive. Among the light foliage shrubs is the Tamarisk. Of the trees and shrubs having yellow foliage, the prettiest are the Golden Poplar, which is really the Golden Cottonwood and is quite attractive to enliven plantations having more sombre foliage; the Golden Spirea, which earlier in the season was prettier than it is now, but is still attractive; the Golden Elder, just now in its glory with gorgeous golden foliage and large, flat clusters of white flowers, which have a pond lily-like fragrance. The Spirea sorbifolia is just now in flower, and its large, white, erect panicles are especially conspicuous.

On the south side of our greenhouse is a clematis known as Clematis coccinea. It has reddish flowers, has been in this situation for some eight or nine years and regularly makes a nice growth and flowers profusely. It is much admired by most of our visitors. Clematis Jackmanii promises well and a little later will be covered with its purple flowers. Coreopsis lanceolata is just now very showy, and it is such a simple thing to grow that it should be in every garden. It is seldom killed out, and often when it is there are generally a sufficient number that come up to take the place of those that have died.

The Buckthorn hedges make a pretty showing at this time, and its value for either high or low hedges should be more generally known in the state. It is perfectly hardy.

There is one feature in the use of shrubs that is quite plainly emphasized in our grounds this year, and that is, that low places can often be filled with shrubs to better advantage and at far less expense than filled with earth. This was brought to my mind by a hollow on our grounds near the dining hall, where at a turn in the drive a hollow was planted with shrubs several years ago and is just now beginning to take on their characteristic colors and forms. As the shrubs are low and the drive comes close by, there is a good chance to look down on the tops of the plants, which is generally the prettiest view that we can get of any plant. In many of our cities there have been ponds, swamps and other low places given to the city for park purposes, and very often the work of laying out these is put in the hands of a civil engineer whose idea generally is to fill up the hole and grade it the same as he would grade a road for carrying off water. If we will stop to think of it for a moment, we will recall that the prettiest natural gardens in the world are sunken gardens, that is, they are valleys where the tops of the plants can be seen plainly. In fact, in many of the European countries gardens are often excavated before they are planted, so that they will be below the walks which are upon the terraces; and some such sunken gardens are quite celebrated.

This is the time for starting geranium cuttings and other perennial plants for winter flowering. Geraniums rooted at this season of the year and given plenty of pot room and all the flowers pinched off until the first of November, will generally flower freely all winter and are in every way superior to old plants taken up in the autumn which have flowered all summer and have their root system disturbed at the time when it is especially desirable that they should be growing vigorously.

Alyssum, candytuft and marigolds sown the latter part of this month will flower profusely in the winter.

It is very important to keep the plants growing vigorously from now on if we expect them to flower during the winter.

Our sweet peas are coming nicely into flower—and in this connection it is important to remember the desirability of picking all the flowers, since when the seed is produced the plants are very apt to ripen up and die.

Secretary's Corner.

TAKES A JOURNEY.—The August Calendar is likely to be written from some point in New England, where Prof. Green has gone to enjoy a summer vacation.

WILL STOP CATERPILLARS.—"By experimenting I have found that the box we use to protect our fruit trees from mice and rabbits will effectually prevent caterpillars from ascending the trees. I use a box two feet high and two or three inches larger than the trees. I have had those boxes on for several days and have not found a worm on any tree so protected, although the trees were covered with worms." A. W. KEAYS, Elk River.

LABELS FOR THE SWEEPSTAKES APPLE EXHIBIT.—The competitors for the large premiums offered at the coming state fair for the sweepstakes apple exhibit would do well to secure labels of Secy. Latham soon and have them filled out at leisure beforehand. (See page 43 of premium list.) These sweepstake collections will include everything in the apple line, seedling or otherwise, and the advantage to the public in having the labels to examine is very obvious. They should be written with care and very plainly, which will require their previous preparation.

VISITING THE EASTERN ORCHARDS.—We understand that Mr. Edson Gaylord, of Nora Springs, Ia., is in the east, examining the old seedling orchards of New England in hopes of bringing to light some undiscovered varieties of apples that will be hardy and otherwise of value in the northwest. It is probable there are yet many very valuable seedling apples in that section still unexploited, and Mr. Gaylord may be the fortunate finder of some in the course of his wanderings. At all events he will be in his element in this pursuit and find happiness and, we hope, renewed vigor. We expect to have him with us at our next annual meeting.

DESTRUCTION OF THE CHARTER OAK.—"In an item on page 239 of the June Horticulturist you are made to say, erroneously, I think, that the original charter oak is still standing in New Haven, Conn. This famous tree was blown down in a great storm, prior to 1865, as during that year I visited the spot where it had stood and saw the stump, capped over with a plate giving its history, the cap being pretty close to the ground. The papers stated that the trunk and

branches were worked into articles for souvenirs, the largest one being a cradle for Col. Colt, the famous manufacturer of firearms. I think our seedling on the Lowry Hill boulevard is a 'grandchild' of the famous tree." JUDSON N. CROSS.

The "grandchild" Mr. Cross refers to is growing, a tiny shoot, in the little three-sided grass plat at the junction of Hennepin and Lyndale avenues, opposite the grounds of Mr. Thomas Lowry.

OUR FRONTISPIECE.—This view of the dinner at our summer meeting is a very pleasing one as emphasizing the social feature of these joyous reunions. The ladies appear to be in the lead, as they should be in so graceful an art as horticulture. If the artist had been long-headed enough to have gone into the west gallery and taken another view showing the other half of the hall, he would have brought out the tables bearing the fruit display of 200 varieties of strawberries, besides other fruits and vegetables and a goodly showing of those members to whom such a display offers irresistable attractions. Division of labor left to them an equally agreeable task. The two views would have completed the picture of the armory at the "annual summer picnic."

NO MINNESOTA FRUIT DISPLAY AT OMAHA.—We are informed that the state commission having in charge the exhibit from our state at the Omaha Exposition has definitely decided not to attempt a display of fruit from Minnesota. The total sum at their disposal for all the interests in the state is very small, and from this the amount that could be spared for this purpose would not meet the necessary expenses attendant upon a creditable exhibit, even though the fruit was largely contributed by the members of our society. Under these circumstances, their decision is certainly a wise one. We could, without question, make a splendid show of fruits during the fall months, especially with the large apple crop we are likely to harvest—and the horticulturists of the state would be satisfied with nothing less, and we should take hold heartily to make it, if the opportunity came.

THE NEW FORESTRY SECRETARY.—Geo. W. Strand, of Taylors Falls, has been appointed by the executive board of the State Forestry Association secretary as successor to the late J. O. Barrett. Mr. Strand is a recent graduate of the State Farm School, and especially well fitted by his tastes and training to take up this important work. Besides his practice at the school he has spent some time in the field in connection with one of the best nurseries in the state, and is now himself engaged in the culture of forest trees. During the interim since the death of Mr. Barrett, the work of the office has been cared for by his son, Mr. H. W. Barrett, until such time as a permanent appointment could be decided upon. All correspondence hereafter relating to the work of this society should be directed to the new secretary. New features of work for this society are under consideration, and beneficial results to this interest are looked for from the youth, zeal and special fitness of the new incumbent. We are all interested in this work and assure him of our hearty co-operation and support.

Yours Sincerely
L. W. Ford

SAN DIEGO, CAL.

THE MINNESOTA
HORTICULTURIST.

VOL. 26. AUGUST, 1898. No. 8.

Autobiography.

L. M. FORD.
SAN DIEGO, CAL.

(See Frontispiece.)

The original home of the Ford family to which the writer belongs was near the Hudson, in the historic town of Stillwater, near Bemis Heights. Our ancestors came from Ireland before the revolution. Our family was a large one, there being six boys and the same number of girls; of these, four brothers only are now living, all younger than myself.

The date of my birth was January 22d, 1825. I have no record of the exact locality. We resided in various parts of Saratoga county, New York, on farms, until most of us were grown up, when we caught the western fever. In 1848 my sister Mary was married to Hiram Shoemaker, who soon after started for the Fox River country, of Wisconsin. The next season father and I came out to see the west, especially the part the newly married couple had selected for a home. He returned, while I went to see my oldest sister, Caroline, who had come out the year before and settled at Mount Palatine, Ill During the winter I took charge of the academy located at that place. The next summer I came to Minnesota. St. Paul was a very small place when I arrived there in the summer of 1850.

Soon after my arrival I secured a claim of 160 acres nearly midway between St. Paul and St. Anthony, one-half of which I sold later to a friend who came up the river on the same boat. On the same land was in later years located the Minnesota Transfer, where so much freight is handled for the great northwest.

The first winter I taught a class in French and a singing school, which was the first ever organized in that upper country. My pioneer nursery was started, in 1851, by taking up some little apple trees that came up in the dooryard of the small building standing on the place when bought.

In 1852 I helped to organize a school district between the two cities, where now are located several colleges. It was called the Groveland school, or District No. 10. Not finding a suitable teacher, I took charge of the school myself, the new building being located on a small hill some distance east of the Merriam Park station of later times.

In connection with the nursery business we carried on vegetable and small fruit growing. A man from Ohio sold me 200 large clumps of Turkey rhubarb for $200, and from this I sold more than $400 in leaf stalks and roots in one year. Early Scarlet and Hovey strawberries brought forty cents per quart before others got a start in that line. After we built the pioneer greenhouse a good bouquet maker was secured from Cincinnati, so that people in the two embryo cities who wanted floral luxuries could find them by driving out to Groveland.

Just before the war of 1861-5 burst upon the country, I started the Minnesota Farmer and Gardener, with Col. J. H. Stevens as assistant editor. Things looked so dark ahead that we were compelled to give up its publication after some over a year's trial. Soon after its suspension, Editor J. A. Wheelock, of the Daily Press, kindly offered us space for a department pertaining to agricultural matters, which was conducted by the writer for many years. In the above publications are to be found a mass of information about the farms and farmers of early times.

During the fore part of 1861 my pet scheme was to get Horace Greeley to visit Minnesota and make a speech at the coming fair. Four letters received from the great reformer I have kept since then and prize most highly. The last was very brief and penned just after the sad defeat at Bull Run—in which he declined to leave his post on the Tribune until a brighter day came to our distressed country. Later he came out and spoke at one of Col. King's big Minneapolis fairs.

My marriage to Abbie Guild, in 1855, at her brother's home in Sandusky, Ohio, her coming here with me in 1885 and death from a paralytic stroke more than a year ago, are all told in the January, 1897, number of our magazine. After coming to this delightful land (and regaining my health measurably) I started again in my old business.

I often tire of our perpetual summer and tropical surroundings, but I never expect to revisit the scenes of my cherished Minnesota; I expect to end my pilgrimage here and be buried with friends beneath the oaks and evergreens of Oakland.

Mr. Ford is very well known to all the older members of this society. While not a charter member, the association was only in its third year when his name appeared on its rolls. In 1884 he was made an honorary life member, to which place he was justly entitled by his many years of faithful service in its ranks. Prior to his removal to California in 1885 his name appears very frequently in our records, and no member wielded a more facile pen or had a larger experience and observation to draw from. He was one of three much prized St. Paul members who, at about the same time, removed to the Pacific coast, W. E. Brimhall and Truman M. Smith being the others. Of this trio Mr. Brimhall is dead, while the others are still in active life, and we hope many more years may be granted them.—SEC'Y.

Trial Sations, 1898.

MIDSUMMER REPORTS.

CENTRAL TRIAL STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

As a whole, this season has been a favorable one for horticultural crops. The winter was not unusually severe, and our standard perennials came through without serious injury, as our abundant crops plainly indicate.

In strawberries, the Bederwood has done exceptionally well and while not of the best color or as firm as desired, yet it is proving itself to be a very desirable sort for the home garden, and as it is a perfect flowering sort it does away with the uncertainties of pistillate varieties. Our three-year-old bed has been plowed up, but we have renewed our two-year-old bed, and it is starting nicely. The following is a detailed report of the varieties of some special interest fruiting here this season:

Bisel.—Pistillate. Does not produce many plants; fruit, medium; a little darker than Crescent; season, long.

Boynton.—Pistillate. This variety has been fruiting for several years and has proved usually very productive. The fruit resembles Crescent very closely. This season it produced more fruit than the Crescent.

Crescent.—Pistillate. Continues to be one of our best yielding berries.

Equinox.—Bisexual. Good quality, good size, broad, flat conic; season, late; not sufficiently productive.

Ideal.—Bisexual. Poor plant maker; fruit, soft; not desirable for market.

Oriole.—Pistillate. Fruit large, of dark color and conical in form; not a good plant maker.

Princeton Chief.—A medium late berry; plants, medium to large, vigorous; very productive.

Silver.—Strong grower, only moderately productive; fruit large.

Saunders.—Bisexual. Medium late; long fruiting season; color, medium dark; quality, fair; productive.

Sparta.—Bisexual. Plants vigorous, not productive.

Staples.—Bisexual. Not productive.

Tennyson.—Bisexual. Not a good plant maker; fruit, conical, red, large.

Timbrel.—Pistillate. Worthless with us.

Tennessee Prolific.—Bisexual. Not sufficiently productive here.

White Novelty.—Has not proved to be valuable here.

Wm. Belt.—Bisexual. Plants, vigorous; fruit, dark red, irregular in form, large; probably not sufficiently productive for market; is rather too soft for shipping purposes.

Raspberries have proved a very good crop and are now nearly harvested. Loudon and Columbian are about on a par as to yield, and both have produced enormous crops of fruit; the former with its bright red color and large fruit is the better market berry, while the latter on account of its purple color is not so popular in the markets, though it is of excellent quality for table use or canning. We like them both very much and think there are no other kinds that come very close to them. The King has not done as well as last season, although it has made a good growth. Royal Church is very productive, but the fruit crumbles too easily to permit of its being of value as a market sort. Thompson's Early produces fruit of large size but not in sufficient quantities to make it very desirable. Miller's Red is not sufficiently productive here for profit. The fruit is bright red, medium firm and of good quality.

In the list of black raspberries we find no better early sort than the Progress and nothing better than Nemaha for general crop, while for home use the Older is the best of all, but is rather too soft for shipping purposes.

Conrath's Early.—This is the largest early black raspberry that we have; quality, good; plants, vigorous and productive.

Kansas.—A very good early black raspberry, but it has not produced as much fruit as Progress for several years.

Smith's Prolific.—Early. Not any better than Progress.

Smith's Giant.—Practically the same as Nemaha.

Several varieties of gooseberries have done well, but our best yields have come from Champion and Downing, both of which produce large fruit that is sweet and of most excellent quality when ripe.

Snyder blackberries are just beginning to ripen, and the outlook is for a good crop of them, and also of Ancient Briton. Early in the season the plants looked weak, and we thought we had allowed more fruit to remain than they could mature, but the fruit has filled out well, and now the outlook is for a good yield. Six Rathburn blackberry plants set out in the spring of 1897 made a fair growth last year, but all died last winter except one plant, which is now not over two feet high.

Juneberries never fail to produce a crop of fruit, and while on account of the great abundance of better kinds of fruit we often fail to gather them, yet the regularity with which they produce makes them desirable, and they, like the mulberry, which always fruits here, furnish a bird food which protects our better fruit. In fact, the birds seem to prefer these rather tasteless fruits.

The fruit buds on most of our cherry trees were again killed last winter, and very few flowers opened, although the trees are thrifty and vigorous. The Lithauer Weischel, an inferior Russian cherry, fruited very well, and a few other kinds have produced a little fruit.

Plums will be a rather light crop, and many varieties will be badly spotted.

Some varieties of apples are heavily loaded with fruit. Our trees are in good condition and have very little blight. A new orchard of nearly three acres was planted last spring, and it is our intention to make this a model orchard, putting out only varieties that are known to be quite hardy.

Vegetables promise to yield heavily, and our trials embrace about the same range as in the last two years.

ALBERT LEA TRIAL STATION.

CLARENCE WEDGE, SUPT.

The season has, up to this date, July 20th; been one of the mos favorable on record, with scarcely a failure in any planting of seed or stock, or loss of a single bud by winter's cold—even peach trees without protection growing within six inches of the terminal buds.

STRAWBERRIES.

A full crop harvested. Lovett and Warfield the most satisfactory market varieties. Bederwood and Crescent equally productive and good for home use. Nick Ohmer on spring set plants showed a little fruit of large size and most superb peach-like quality. Bubach too soft and perishable for any use. Haverland bore a fair crop of fine fruit.

RASPBERRIES.

All varieties bore a good crop, which at this date appears likely to be somewhat shortened by drouth. Ohio, Older and Nemaha, of the caps, were very satisfactory. Loudon exceedingly fine, with large, firm, bright colored fruit, of nearly best quality; if it remains healthy, it is sure to become a favorite. Kenyon, of good size and productive but seriously lacking in quality and appearance. Columbian is more healthy in cane and firmer in fruit than the Schaffer which it closely resembles; berry does not seem to be quite as large as Schaffer, however.

GOOSEBERRIES AND CURRANTS.

These fruits gave an excellent crop. The Downing gooseberry seems to meet a demand for a large gooseberry and is very productive and easy to pick. Columbus makes a strong growth but, like all kinds we have tried, will mildew in unfavorable weather.

The North Star currant matures its wood and fruit a trifle later than the Red Dutch. As the bushes get age, the Long Bunch Holland becomes very valuable, as it matures late and bears a fine crop of berries well sheltered from hot winds by its abundant foliage. White Grape is unequaled for family use, and while jelly made from its thoroughly ripe fruit may not be as solid as from that half ripe, it is the most rich in flavor and quality of all we have tasted and of about the color of the ripe fruit.

CHERRIES.

Of the Russians, we have had some fruit from Orel 23, Late Morello and Bessarabian. The size and quality of this fruit may not be of

the best, but if a test winter prôves them to be sufficiently hardy we shall prize these varieties very highly, as we now have little doubt of their being reasonably productive. The first mentioned is quite early, the others ripen together some two weeks later.

LA CRESCENT TRIAL STATION.

J. S. HARRIS, SUPT.

This is a voluntary station, designated by the State Horticultural Society for the purpose of securing and putting on trial to test their hardiness and adaptation the Russian and such of the older varieties of apples as have not heretofore been discarded, all new northwestern seedlings of any promise, as fast as trees or scions can be secured, native plums, raspberries, strawberries and novelties in small fruits that are offered from year to year by nurserymen or their agents. Our method of late years has been largely to secure scions and cuttings and from them to raise our own trees and plants needed in the work, setting trees and plants on the fruiting grounds when they arrive at a proper age and size—apple trees usually from two to three years of age, and two or more of every variety. The orchard now contains over 1,000 trees, ranging from three to seven years old, and of about 300 varieties. Thirteen varieties were added last spring, and there are about forty varieties in the nursery ready for planting next spring. It is not likely that the number of varieties will increase very much in the future, as each year some varieties show strong tendency to blight and other weakness and will be taken out and their places filled with other new varieties, and if they are varieties that have been brought to the notice of the public, their defects will be carefully noted and reported upon. The nursery contains a number of varieties that have never been propagatated any other nursery or station. We have only recently began using Virginia and Tonka crabs as stocks for top-working. They appear to be all right for most variety but not as satisfactory as the Hibernal and Peerless,

Although the past autumn was extremely dry and there was little or no moisture that reached the roots of trees during the winter, there was just enough snow to prevent the ground from freezing, and the temperature was so even and mild that no injury was done to trees and plants of reasonable hardiness.

THE FRUIT CROP OF THE PRESENT SEASON.—Strawberries went into the last winter with a large portion of the plants light-rooted. They wintered well, bloomed abundantly and produced a fairly good crop of excellent fruit, the season lasting with us thirty-five days. The Bederwood fully sustained its reputation of last year and gave a larger yield than any other variety, either staminate or pistillate. The Lovett yielded a fine crop and is proving one of the best pollenizers for the Warfield. Among the newer varieties, the Clyde, Brandywine and Splendid are the most promising, and I think they are destined to become leading varieties. All of them are bi-sexual, which is favorable for planting by farmers.

No winter protection was given to raspberries, but they came out without any serious injury; even the Cuthbert was killed back little. The crop is exceptionally good, and the Loudon has sustained its reputation for hardiness, productiveness and quality. The Royal Red has done well and promises to be a very desirable variety. The Royal Church is a quite hardy and very productive plant; fruit large, bright colored and good flavor; a good variety for home use but unfit for market, as it must be very ripe when picked, or it crumbles badly. The Miller has borne abundantly this season, is early, and I esteem it above the Marlboro for general cultivation.

Gooseberries have been more than usually troubled with mildew, and the crop was light, the new Red Jacket being the freest and best of all the varieties that fruited with us. In currants, the Prince Albert and Long Bunch Holland are doing the best. All other varieties blighted and lost a portion of their foliage early, greatly lowering the quality of the fruit.

Blackberries and grapes promise good crops. Native plums did not pollenize well and will be a light crop.

Apple trees are blighting considerably but not as badly as last year, and the fruit has dropped badly, so that the crop will not be as heavy as at first anticipated.

July 15th, 1898.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

Too many strawberries were grown this year to be a profitable crop to the grower. The season extended from May 8th to July 1st. Red raspberries apparently wintered in good condition, but a frost in April hurt them severely; from one-fourth to one-half an average crop is the result. The Loudon was injured the least of all the varieties growing here. All varieties of blackcaps have done well. The Conrath does not compare favorably with the Palmer. Blackberries promise a good crop.

Native plum trees are loaded with fruit; the Russians have all fallen off. Apples continue to fall badly, though half grown in size. All trees and plants have a heavy growth of foliage and appear in vigorous condition.

July 11th, 1898.

MONTEVIDEO TRIAL STATION.

L. R. MOYER, SUPT.

Among the new material placed on trial at the station this spring is the western sand cherry (Prunus Besseyi), the western wild cherry (Prunus demissa), Japanese snowball (Viburnum plicatum), Manchurian honeysuckle (Lonicera Ruprechtiana), Atrapharis lanceolata, Spiraea oblongifolia, Golden Philadelphus, Lonicera microphilla, Caragana Chamlagi, Eleagnus argentea, Salix regalis, Black Hills spruce, white ash, Pinus ponderosa, Pinus sylvestris and Pinus Austrica. Sufficient material was furnished by the Depart-

ment of Agriculture to set two acres of the last named pines. The Scotch, Austrian and bull pines have been on trial in a small way here for several years. The result of the new plantings on the open prairie may be of interest. The thanks of this station are due to Prof. B. E. Fernow, Prof S. B. Green and Mr. O. F. Brand, for material furnished.

THE HARDY BORDER.

The earliest shrub to bloom at the station was as usual the buffaloberry, but the flowers are quite inconspicuous. The pistillate bushes are now bending beneath an immense load of fruit. Van Houtte's spiraea soon followed and showed a dazzling mass of white flowers. No shrub border, however humble, ought to be without Van Houtte's spiraea. Spiraea hypericifolia bloomed at about the same time as its more showy rival, but was wholly cast into the shade by it. The golden-leaved nine-bark suffered some from the drought, but the typical form, now called by botanists Opulaster opulifolius, came through in fine shape, and at the present writing its showy seed pods make it an object of perpetual interest. This shrub seems to do as well in cultivation on the prairies as it does in the ravines of the Mississippi bluffs in the eastern part of the state, where it is indigenous.

The June-berries, Amelanchier Canadensis and A. Botriapium, make a very desirable addition to the shrub border. They never suffer from drought or cold, and in early spring their airy racemes of graceful white flowers, set off by the soft, silky young foliage, are a sure token that spring is really with us. In the east the blooming of this shrub is associated with the first run of shad, and so it is sometimes called shad-bush. It is now covered with attractive fruit much liked by the birds.

The caraganas maintain their reputation as being a very desirable shrub for planting on the prairies in the hardy border. Caragana arborescens seems to be quite distinct and tree-like. The others, which we have received under the names of Caragana frutescens, C. mollis glabra, C. pygmaea, C. variegata and dwarf caragana, all seem to be varieties of Caragana frutescens. The typical C. frutescens seems to be more upright and fastigiate in its habits of growth than the others. They are all given to spreading from the roots; the variety known as variegated caragana having the strongest tendency in this direction. Caragana Redowski, as we received it, seems to be identical with Caragana arborescens.

The caraganas are well adapted to parkway planting in the shrubberies bordering village streets.

The Amur barberry as received at this station appears to be only one of the many varieties of Berberis vulgaris. The barberries are all extremely well adapted to prairie planting and are extremely attractive shrubs at all seasons of the year.

It seems like useless repetition to refer in each of these reports to the great value of lilacs for prairie planting. All the varieties of Syringa vulgaris are doing extremely well so far as tried. Charles X gives larger flower clusters than the type. Syringa villosa

bloomed this year for the first time, showing clusters of creamy white flowers about two weeks after the other lilacs had gone. In its general appearance this lilac closely resembles an ash tree, to which indeed all the lilacs are closely related botanically.

The Manchurian maples (Acer Tartaricum ginnala) appears to differ so much from the descriptions we have of the typical Acer tartaricum as to be entitled to rank as a separate species. The fruiting trees are now showy with the reddish wings of the abundant fruit. Some of the non-fruiting trees are showing variegated leaves.

The Russian plums, 19 and 20 Orel, were accidentally placed in our shrub border. They make good border shrubs and promise some fruit this year. We have the Besarabian cherry, too, in the shrub border, where it is growing with great vigor and sprouting abundantly from the roots. Its great, green, glossy leaves, and its dense and vigorous habit make a dark and very attractive shrubbery. If the shrub has any fruiting proclivities, they do not as yet develop. The European choke-cherry is rather more drooping in its habit than ours and is loaded with fruit. Prunus villosa is an ornamental early blooming shrub of much promise, and Prunus Maackii should be in every shrub collection where early flowers are desired. The sand cherry was a disappointment this year. It suffered greatly from the drouth and shows much dead wood. It is strange that a South Dakota shrub should suffer where so many other things came through uninjured.

Our native red-berried elder (Sambucus pubens) is a shrub of such thrifty habits as to almost crowd out the adjoining planting of European golden elder. The golden elder is occasionally cut back somewhat by the winters here, but starts again vigorously and is now covered with attractive flowers. A golden elder or two in a dark shrubbery is not amiss. Catalpa speciosa has to be treated as a shrub here, and much dead brush from it necessarily goes into the brush piles every spring. It is valuable to give a tropical effect to the other shrubberies, and occasionally it blooms.

The flowering currant imported from Russia as number (?) appears to be identical with our old fashioned Ribes aureum, but the importation was of value to call attention again to a first class old fashioned shrub.

The basswood trees are in bloom, and we catch their delightful perfume. This tree is a very common native here, but it has been found difficult to cultivate on the prairies. We have tried the plan of allowing it to sprout freely from the roots, with every prospect of success.

The Russian olive, which according to Prof. Bailey is Elaeagnus hortensis Songorica, sent out by Prof. Budd as Elaeagnus Augustifolia, ought not to be overlooked by the prairie planter. It improves greatly with age and becomes a large spreading shrub with beautiful silvery leaves. A form of this shrub sent out by Green's Nursery Co., of Rochester, N. Y., as Russian olive, has short and wider and less silvery leaves, and does not seem to be nearly so desirable.

The Russian artemisia, sent out by Prof. Hanson, is a rapid growing shrub and sometimes reaches a height of five feet the first

season from cuttings planted in the spring. It flourishes in poor, dry soil where grass will not grow and in connection with lilacs, bush honeysuckles and caraganas, offers an excellent means of covering slopes in cuts and along embankments, where lawn grass cannot be induced to grow.

We have a great admiration for the dwarf almond (Amygdalus nana), one of our hardiest shrubs, imported by Prof. Budd from Russia. It produces a profusion of pink flowers early in spring, but so far we have not gathered any almonds from it. This shrub is of the easiest culture and ought to be in every flower border on the prairies.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

Fruit trees, as a rule, came out this spring all right. Raspberry bushes were mostly killed to the ground, and the raspberry crop is a total failure.

The strawberry crop was extra fine, the heaviest one we ever had. The Bederwood, Warfield, Crescent and Enhance were mostly grown. The Bederwood holds its large size and productiveness remarkably well on old beds, excelling the others in this respect. It is apparently all the variety needed for the home garden. I think that the Warfield was in the lead on beds fruiting for the first time.

The dwarf Juneberry bore an excellent crop as usual, and was much admired by visitors. It has proved to be a most reliable fruiter.

Cherry trees set in for a big crop, but the fruit kept dropping until there were but few to get ripe; 23 Oriel gave us some fine fruit.

Currants are almost a failure, the Long Bunch Holland being the only variety that is giving us any satisfaction this summer. They are very late. We will not gather the fruit for a week or ten days yet.

Plums will be only a light crop; still some varieties, like the New Ulm, Rollingstone, Rockford, Desota, Wolf, Mankato, Blackhawk, and Wood are bearing a full crop. My small trees of the Aitkin plum have some fine fruit on them. I am more pleased than ever with this variety. The Cheney and many other varieties were a failure from plum pockets. I believe that some of my plum trees had ten bushels of plum pockets on each tree.

Apples will not be a heavy crop. The Okabena, Wealthy, Breskovka, Duchess and Tetofsky are bearing fairly well. In crabs the Florence,and E. Stawberry are bearing full. We have the little green leaf hopper bad here. They are everywhere, but no damage is noticed except on the foliage of the apple trees. The Soulard crab seems to be proof against their attacks, also some other varieties to a certain extent.

We have had plenty of moisture in the ground up to this time.

July 16, 1898.

VIOLA TRIAL STATION.

WM. SOMERVILLE, SUPT.

Small fruit in our neighborhood was a good crop where raspberry canes were covered, but badly injured where they were not. Grapes are doing well. The apple crop on our place and in the neighborhood generally, I do not think any better than last year; the Duchess is falling off the trees badly, and the trees of all varieties that bore heavily last year have but few this year. In the spring every tree was full of bloom, but for some cause the blooms fell off, and the apples did not grow. But we will have a fair crop.

July 13th, 1898.

MR. BUSH'S METHODS IN ORCHARD AND FRUIT GARDEN.

A. K. BUSH, DOVER.

(Extract from a letter.)

Not hearing from me, you may think I am out of horticulture entirely, but I can assure you and all our brothers engaged in that profession, that I am "strictly in it" and can be found at home almost any day in my orchard and fruit garden, with coat hanging in some near-by apple tree, giving demonstrations in practical weed-killing, cultivation and fruit growing in general. I am pleased to note that everything is growing nicely, as the season has been very favorable; even the chronic grumbler is wearing a smile, which becomes more visible as the large, all-round crop matures and is ready to harvest.

My strawberry field of about an acre, growing between rows of apple trees, supplied berries in abundance for a half dozen families, and in addition to this demand my children sold enough fruit to quite pay the cost price of the land, forty dollars per acre, and all expense of growing the crop. Most of this fruit was sold at three and four cents per quart, on the ground; for our family use they were picked "on shares," saving all expense to us of gathering, boxes, crates, etc.—an ideal way of handling a crop of berries.

My crop of raspberries, currants, blackberries, etc., are going the same way, at two or three cents below the market price of crate lots. The neighbors come for miles around to gather fruits on these terms. We could dispose of much more than we have on one ten-acre field.

It does me good to see the boys and girls "fill up" with fruit as they gather the same. Their parents say: "Well, we shall try and have some home-grown fruit next year,"—when they see the possibilities of a fruit garden and note the enjoyment of the children as they sample its products.

I would suggest to others who are losing money shipping their fruits a long distance by express to unknown and unreliable commission merchants, to test this method. My small fruits are all grown between the apple trees arranged as I taught in my institute

work last winter. The cultivation is done very largely with horses, reducing the cost of fruit growing and selling to a minimum.

Farmers, plant nothing but staminate varieties of strawberries, keep the ground well fertilized and mulched, do not allow any grass or weeds to seed, keeping them mowed, and you will have fruit, while you have vigorous plants and blossoms! I would advise farmers and amateurs to try this method. The third crop on my grounds this year was the best I had, and I have not cultivated or hoed them since the first season. I use the mower as soon as the crop is gathered, rake and burn the rubbish, then promptly fertilize and mulch during the fall or winter with clean straw. I am well pleased with results so far.

Many of my apple trees which have been out in orchard three years show considerable fruit. The plum orchard of 300 trees planted two years ago is full of fruit and is complimented by all who see it. There is no excuse for not growing that popular fruit in abundance in any part of our state. They are worth planting for a rapid growing "shelter belt" on our western prairies, where evergreens succeed only when planted under shelter of other trees, and the fruit is always in demand at home or abroad.

I am anxious to hear from every seedling apple tree in our state which is in bearing. If all members of our horticultural society would be on the alert for such trees, sending samples of fruit, with short history, description, etc., stating season, quality, also how affected by blight, vigor of tree, hardiness, etc., to Prof. S. B. Green, St. Anthony Park, I am quite certain they would furnish material for a bulletin on seedling apples originated in Minnesota, which would be very valuable to the entire northwest country. I hope a large collection of such apples will be on exhibition at our state fair this fall, and that we may have the bulletin in the near future—as this year is very favorable for gathering the required material.

How about that "1000 membership work?" Let's all unite in the "push" and "get there!"

A. K. BUSH.

APPLE BORERS.—These insects are very difficult to deal with. When the borer has entered a tree, it can only be destroyed by cutting out or with a pointed wire. The best means is to prevent the laying of the eggs. This may be done by washing the trunks of the trees with strong alkaline solution, such as lye or solution of soft soap. The following is recommended: Into a gallon of common soft soap, thinned with a pailful of hot water, stir a pound of crude carbolic acid. Add to this, after it has stood for a day or so, 30 gallons of cold water, making a barrel of the liquid. This material is to be brushed over the surface of the trees from the ground up at least two feet.

PROTECT TREES WITH PINE TAR.—To keep rabbits from injuring fruit trees, mix pine tar and grease equal parts, warm and apply with a cheap paint brush to the lower two feet of the tree trunks.—J. W. Dunn, Texas.

FOREIGN TREE DEALERS.

C. L. SMITH, MINNEAPOLIS.

Mr. President, Ladies and Gentlemen: Before reading what I have written here, there are a few things I want to speak about of which I intended to write, but which I did not get into my paper. One thing that I overlooked is the fact that some of our successful men, some of our enterprising men, some of those who have exercised a very large influence on the horticultural interests of this state have come to us as foreign tree dealers, and we ought not to overlook the fact that sometimes in entertaining foreign tree dealers we have entertained angels unawares. Dr. Jewell was one of those men who came to us as a foreign tree dealer, and his work stands as his greatest monument today. A. W. Sias came here as a foreign tree dealer. Mr. O. F. Brand came to Minnesota and learned a good many things about horticulture, started a nursery and raised a great many trees in Minnesota. L. B. Hodges, the man who was instrumental in organizing this society, and who probably gave the greatest stimulus to tree planting on our prairies, came here as a foreign tree dealer.

The reports of the Minnesota State Horticultural Society make frequent reference to the "foreign tree dealer," but I think you will all agree with me that the reference is always far from complimentary or commendatory. In fact, I think it may be said without exaggeration that at every meeting of the society almost every member has some grievance to record or some abuse to report against the "foreign tree dealer."

During all the years since this society was organized the foreign tree dealer has been kicked and cuffed, denounced and derided, his devices have been exposed, his stock black-listed, his name made a by-word. Laws have been enacted against him, the powers of the press invoked to suppress him; but despite all this he has lived and prospered, increased in numbers, multiplied his devices, and continued to harvest the dollars from the farms, the villages and the cities of the state. When it comes to honors at our annual meetings or at the state fair, our own painstaking, persevering, conscientious, intelligent and philanthropic horticulturists carry them off easily and worthily; when it comes to dollars, a band of well organized foreign tree dealers, with books of pictures, bottles of fruit, yards of cheek, vivid imaginations, no limit of language and no trace of conscience, will easily gather more dollars in a single season than a conscientious, fair-dealing, local grower can get in a lifetime of faithful work.

Primarily, this is why the foreign tree dealer continues to flourish: because there is money in the business. They are after money, and are more interested in gathering dollars than in the distribution of reliable horticultural information. As a rule, their motto is "Get

money, honestly if you can, but get money." In doing this they visit all parts of the state, they see all classes of people, they tell all kinds of stories, use various arguments and illustrations. These are often apt, ingenious and timely. They are intended to arouse the interest, fix the attention and stimulate the desire of the listener; that they accomplish their purpose is evidenced by the fact that they secure the objective dollar. Admitting that the betrayal of trust, loss of interest and disappointment often destroys the value of the lesson to the individual, the fact remains that the widespread, continuous, persistent, intelligent, persuasive, plausable—aye, convincing missionary work of the foreign tree dealer does induce people to plant trees on the farms, in the village garden or on the city lot.

Not all their stories are true, nor all their trees good, neither are they all bad. Millions of cuttings of the white willow were sold the early settlers and became the foundation of the beautiful groves around the farm homes of central and southern Minnesota. Later on every farmer was visited from one to a dozen times each season and urged to plant seedling cottonwoods around his home. Eloquently the tree dealer pictured the discomfort of a home on the prairie unsheltered by trees during the long, cold winter; then came a glowing picture of such a home transformed by trees to a haven of rest and comfort where the snow did not drift, the winds did not blow and the blizzard had lost its terror. That these itinerant foreign tree dealers were powerful educators is evidenced by the living monuments they have raised in trees and groves, and the empty pockets of their students. Millions of seedlings of the ash, box elder and soft maple have been distributed by foreign tree dealers. And we should not forget that in nearly every instance where the dealer secured an order for one or more thousands of those seedlings he had to lecture for an hour or more on the benefits to be derived by tree planting. The planting of small fruits has been greatly stimulated by the work of the foreign tree dealer. He stops at the humble home of the prairie farmer, exhibits his wonderful samples, natural size, tells of marvelous yields, assures the farmer that his soil is peculiarly adapted to the growth of small fruits, delivers an elegant, beautiful, carefully prepared and convincing dissertation on the healthfulness, economy and pleasure of a good supply of berries grown in one's own garden. The education is successful; the farmer and his family are convinced, and the order is given—royal raspberries, golden gooseberries, tree currants, grapes that need neither covering nor pruning, and various other things so new, rare and wonderful they were never heard of outside the catalogue of the foreign tree dealer.

Nevertheless, the farmer has been educated, inspired and benefited. His raspberries prove to be Turner or Philadelphia, his gooseberries are Houghton, and his currants are Red Dutch. They cost him four prices, but he got the fruit, the education and the experience, while the educator got the money.

These foreign tree dealers are not all bad, neither are their trees

all worthless. Only last year I found one who was selling budded apple trees for only one dollar each. He was doing a thriving business in the neighborhood of a local nursery, where thrifty, well grown trees of varieties approved and recommended by the Minnesota Horticultural Society were for sale at nominal prices. The local nurseryman, however, was unable to educate his neighbors up to the point of interest and confidence that would induce them to buy his trees. The foreign tree dealer, with his better methods, did accomplish this and sold hundreds of trees. His budded tree nursery was, however, a myth existing only in his imagination. When it came to filling orders he purchased a fine lot of hardy, thrifty, well grown trees from a well known local grower less than 100 miles away. The trees were carefully handled, and I believe are all growing well.

Our climate, the newness of the country, the character and habits of the people, make horticultural education a necessity. The cheapest and most reliable means of education is that afforded by the Minnesota Horticultural Society and the pioneer horticulturists of the state. The most expensive educator, the unreliable educator, but at the same time the best patronized, the most persistent and extensive educator is the foreign tree dealer.

He is successful because the people desire novelties and sensations; they are greedy for new things. They are easily bamboozled, in fact, rather seem to enjoy it. No other method of selling trees has yet been found so successful as personal canvassing from house to house. No other means of education on the subjects of fruit raising and tree planting has as yet been discovered equal to thirty minutes personal contact with a well qualified tree dealer.

New names, novelties and high prices are necessary to cover the cost of this expensive method of selling trees. So long as the people are able and willing to pay for this kind of education, they will find instructors ready and willing to take their money.

The local tree grower who expects to harvest dollars must enter the field with the foreign tree dealer and compete with him along his own lines, show as fine pictures, have as high sounding names, tell as large stories, charge as high prices—but furnish better stock.

Experience demonstrates the fact that the average man or woman who needs education in small fruit culture, prefers to pay one to two dollars per doz. for Golden Wonder strawberries rather than one dollar per hundred for Crescent, Warfield, Wilson or Downing. A canvasser making a house to house canvass who should beautifully describe the good qualities and beauty of Linden Americana, offering them only one to a customer at $2 each, would do a thriving business, where he would find few customers for basswoods at 25 cents each.

The foreign tree dealer is a great educator; he comes high, but the people want him, and as long as they are willing to pay the price they will get him. In those things that are good and useful we may imitate him. We cannot suppress him so long as he finds profit in the business. A tree dealer, like a prophet, needs to go away from home for either honor or wealth.

Mr. Dartt: I think the gentleman did not emphasize one point sufficiently, and that is the faculty of the foreign tree dealer in one direction, which is and should be one of his chief characteristics. He should be and always is a well educated, persistent liar. (Laughter). No local tree dealer can compete with him in any way, and he may possess all the other characteristics of polite language and a smooth tongue, but he must make up his mind to be one of the biggest liars on God's earth. (Laughter).

Mr. C. L. Smith: I rise to say that with an experience of over forty years with the so-called foreign tree dealers, I have found that the successful foreign tree dealer, the most successful tree dealer, does not necessarily need to be a liar. On the contrary, he is the man who collects the facts and truths as he finds them on the farms and through the localities where he works and then presents them to his prospective customers in such a manner as to claim their consideration by telling them the truth; and a man can succeed many times by telling the truth where he would fail by telling a lie. They tell the truth and tell it in a tactful way, they tell it in an attractive way so it will draw attention. After I had written this paper I read it over to an attorney of this city, a friend of mine. In commenting upon it, he said: "That is all true, but there is one point you have left out, and that is this: The success of the foreign tree dealer, whether he works in person or through his catalogue, depends on the fact that he presents some attraction in such a way as to fix the attention of people. So far as I am concerned, I have been in the habit of sending away for plants and flowers, things I know I could have bought in the city, but every year I get catalogues, and there are some nice pictures in them of things I want, and I get them because they have been presented in such a way as to attract my attention." I do not think it is necessary to be a liar in order to be successful in the nursery business.

Mrs. Kennedy: But all the same, they are the most inveterate liars on the face of the earth. (Great laughter).

Mr. C. L. Smith: I will plead guilty in one respect: When I began business my employer said, "Be very careful never to tell a lie unless it is necessary. If you do tell one, be sure you stick to it forever." (Laughter and applause).

THE RED RASPBERRY IN MINNESOTA.

A DISCUSSION.

(Concluded from the July number.)

The President: I would like to ask Mr. Lyons about the time of covering. Why is it necessary to wait until late? If you have a good many to cover, why do you have to wait until the leaves are all killed by frost?

Mr. Lyons: There are some varieties that shed their leaves quite early, and those which hold their leaves the longest I cover the latest. The Loudon and Columbia shed their leaves the latest.

The President: That is just the point I want to bring out. Do you know that it will do any harm?

Mr. Lyons: I do not know. I always delay it until the leaves fall if I can.

The President. What time do you commence to cover?

Mr. Lyons: I calculate to have them covered by the first of November, so I commence the first of October.

The President: In covering our raspberries we were sometimes afraid there would be some damage done by covering them too early, but so far we have done no harm. I hardly think that in covering them with dirt there is any danger of moulding.

Dr. Frisselle: I have had a large experience with raspberries, and I have come to the conclusion that it is an advantage to cover them early. If you wait until it is cold and frosty, then, in bending down the canes, they are liable to break. The best time is when the canes are warm and wet, when they are not liable to injury. Blackberries are very liable to break if the weather is cold and frosty; more so than raspberries.

The President: Did you ever try covering the raspberries and leaving the old brush there? I think you could save something in that way. That is, cut out the old rubbish and allow it to lie on the ground until after the canes are covered, and then burn it.

Mr. Lyons: You might let it stay until spring; it would hold the snow better; but I draw it off.

The President: Why not leave it there until spring and then burn it?

Mr. Lyons: It would be in the way of covering them.

The President: I do not think so; we have not found it so. We just gather it up in little windrows and let it lie there, and it saves considerable labor.

Mr. Lyons: I think it is better to have the ground clean.

Mr. T. T. Smith: In covering your raspberries, do you use the plow or the shovel?

Mr. Lyons: We use the shovel in covering our red raspberries.

Mr. T. T. Smith: I would like to ask whether it is absolutely necessary to cover red raspberries. One of my neighbors has a small patch in his garden, and I was at his place last summer when he was picking raspberries, and the bushes were perfectly full, and he never covers them.

The President: Mr. Lyons said while it would do not to cover them, he thought it was better to cover them.

Mr. T. T. Smith: The difference between the methods of field culture and garden culture probably makes it necessary to cover some in the winter. Those planted in the garden were planted probably three feet apart each way, and the bushes caught snow enough to protect them. It would not do it if they were planted six feet apart.

Mr. Kimball: In reference to this point of covering, I read in the Iowa horticultural reports of a man who had covered part of his plantation, several acres, and left several acres uncovered; they were varieties such as we raise right here, and that is two or three hundred miles further south. He stated that he kept an accurate account of the cost of covering and of the receipts from those covered and not covered, and while it cost him $15 per acre to cover them, they earned him $45 more than those not covered, showing a profit of $30 per acre, which I think plainly demonstrates that it pays to cover.

Mrs. Stager: Is it absolutely necessary to cover the whole raspberry bush from the root up? I generally cover the tops only, and they do well that way.

The President: Does the snow cover them?

Mrs. Stager: Most generally it does. I have good crops.

Mr. Lord: A large grower in our county has been in the habit of cutting them out and trimming them out as much as he would in the spring, then bending them over and putting stakes over and plowing them under. He has missed whole crops for the last four or five years by this process, while those he has left undisturbed were all right; so he has quit that kind of work.

Mrs. Kennedy: We have three-fourths of an acre of raspberries; we sold three hundred crates, and we have from five to fifteen pickers, and we never cover our vines. If they can do any better by being covered I would like to know it, and I will cover them.

Mr. Murray: My experience has been that the Turner will go through almost any winter without being covered, but my experience also has been that where they are not covered the snow piles up so deep as to completely cover them. Mine have been so deep under snow that there was no need of covering them. If the snow accumulates and gets hard and then settles, it comes right down on the bushes and smashes them to pieces. I have covered some of mine to keep the snow from ruining the bushes, if for nothing else.

Mr. Wright: I would like to ask Mrs. Kennedy where her place is located, and if she has the success she speaks of every year. Some years vary in regard to fruit standing over winter unprotected.

Mrs. Kennedy: My place is five miles north of Hutchinson. Our raspberries, as a rule, do well every year.

Mr. Wright: I have lost several crops on account of not covering but bending over, and two years ago my Cuthberts which were not covered killed down to the ground entirely, while those that were covered did nicely.

Mr. T. T. Smith: Do you cover them up entirely?

Mr. Wright: I cover the Cuthbert and Marlborough up entirely; I do not half cover them, but bury them completely out of sight.

Mrs. Kennedy: We live in the timber, and we have timber protection on the north, but we have no protection on the west and south; there is timber on the east and north. We have the Turner, the Marlborough and the Miller.

The President: How many years have you been raising raspberries?

Mrs. Kennedy: About twelve years.

Mr. Lord: I want to make one point in regard to covering in the winter. I have covered only one winter for twenty years. A few years ago I had two rows twenty-seven rods long which I covered, and they were subjected to exactly the same conditions. The first half of one row was heavily manured, and the other end was not; but the first half killed out entirely.

Mr. T. T. Smith: I would like to ask in regard to mulching raspberries. What is the practice, and what is the result of mulching, and what is best to mulch with, clover or barnyard manure?

Mr. Wright: I cultivate my raspberries and mulch my blackberries with marsh hay, and I have my hay on hand now to mulch another year. I believe marsh hay is the best mulch we can get.

Mr. Lyons: I have mulched some with wheat straw and found it very beneficial on small patches, but where there are ten to fifteen acres of fruit I find it best to cultivate.

Mr. C. L. Smith: Near our cities where straw is worth from ten to fifteen dollars per ton it would not pay, and it has occurred to me that a man could use clover hay and grow it himself.

The President: I'll tell you what you can mulch with cheaper and that is dust.

Mr. Lyons: That will do very well in a dry season, but where you mulch with hay, straw or clover it prevents the berries from getting dirty and gritty.

The President: What does clover cost to grow?

Mr. Lyons: You can grow three tons of clover to the acre, and you can use an acre of clover to mulch two acres of raspberries or blackberries. You can raise three hundred dollars worth of fruit from an acre, and it might pay to mulch with clover.

The President: If you get three hundred dollars an acre from your raspberries, how can you afford to grow clover on any of your land?

Mr. T. T. Smith: I have over one hundred acres, and I have got but one or two in raspberries. I could take one or two acres or five acres and grow clover cheaper than I could import my mulch and run the risk of bringing in thistles and wild mustard.

Mr. Allyn: My brother-in-law mulched one year, and before he got through with it his patch was all covered with wild morning glory vines; they grew better than the raspberries.

The President: In mulching you are very apt to get the ground foul. The expense of keeping the wild morning glories and quack grass out is too much, and it is cheaper and better if you have to depend on hired work to have the ground thoroughly cultivated.

Mr. T. T. Smith: Even with wild grass that has no seed, the ground is apt to become foul.

The President: I have a patch of wild crab trees which I mulched to keep the weeds out, and this summer I had to mow it. I think the mulch is three feet thick. I made up my mind I did not want any mulching.

There is a kind of mulching our friend Somerville employs that I believe in. He draws out coarse manure and turns the hogs in—but I do not call that mulching. I have tried mulching two or three feet thick, and I cannot keep the grass out. It seems almost like a false statement to make, but it is true, and unless you have the hogs to turn in you had better leave the mulching out.

Dr. Frisselle: In mulching with straw, hay or clover it adds to the richness of the soil. Hay is valuable, and so is straw. Would there not be an advantage in that way?

The President: If you want to fertilize your ground, I think you can find something better than straw.

Dr. Frisselle: Straw would be better than nothing.

The President: A little bit, not very much. Are there any other points you wish to bring out on this subject of raspberries? The matter of cutting back raspberry canes is something I am interested in. Does it pay to head them back as recommended in years gone by; that is, let them grow twelve to fourteen inches, then pinch them back to try to get a lateral growth—or let them grow right on? I should take the negative of that question. I do not think it pays. It has been advocated in the past, but if any one has any different idea, I should like to hear them.

Mr. Murray: If you allow them to grow, does not the wind break them down?

Mr. Jewett: We would have to take a step ladder to pick them.

The President: We have not got such fertile ground as that. This is quite an important thing. I was told years ago when I got my instruction in this horticultural society that, after planting and cultivating for a year, to provide a trellis I should put up posts and wire. Then I was told to top them off and get laterals and all that, and my experience is, I do not want to follow either one of those methods, and I do not want to cut them off. It is quite an expense to put them upon a trellis, and it is quite an item of work to get this lateral growth. As the discussion showed this morning, the difference in the soil and location makes a difference in the fruit, so it makes a difference in the trimming, etc. I thought we had a pretty good soil—it is a loam with clay subsoil—and after all, with our best soil, I do not think it pays to top them or to put up a trellis. I do not know what you are doing, but if you are building a trellis it is my judgment you ought to stop and think if you cannot get better results.

Mr. Wright: Tell us your plan. Do you cut back at all before fruiting?

The President: A little in the spring.

Mr. Wright: Don't your bushes bend over?

The President: I let them have the ground to bend on.

Mr. Wright: And you keep a dust mulch for them to bend into?

The President: Why, yes, we do not have any trouble.

Mr. Wright: I would not like to pick that kind of berries.

The President: I did not say a dust mulch, but we cultivate very thoroughly.

Mr. Pond: Don't your berries get pretty dirty after a rain?

The President: We do not have much trouble of that kind. If you are going to mulch the ground to keep the berries clean, that could be done, but I do not think the additional advantage of a trellis warrants the expense.

Mr. Wright: Do I understand Mr. Lyons to say he keeps his back to three feet?

Mr. Lyons: The first year I top them at twenty inches, and the second year at three feet.

Mr. Wright: In the spring when you uncover them?

Mr. Lyons: No, in the fall when I can cut the terminal buds off.

The President: Do you tie up your raspberries at all?

Mr. Lyons: No, we do not have any trellis.

Mr. Crane: What number of canes will do best in a hill; that is of red raspberries?

Mr. Harris: About six.

Mr. Lord: I should say it depends upon the strength of the soil.

Mr. Harris: On the black raspberry question, we have tried almost everything. We took a notion that the trellis was a paying investment. We are now taking the trellis down and burning the posts, and are using the wire for grapes. The trellis does not pay; it is a nuisance all round. In regard to the topping of the bushes we do that, not because we think it is better to do that, but we believe it is better on account of picking, just as the picking season begins. I do not believe that cutting back is any advantage. I cut back in the spring according to the condition of the plants.

Mr. Wedge: I would like to see an expression by a show of hands as to how many favor the trellis.

The President: This applies to black raspberries only.

By a show of hands, two expressed themselves in favor of the trellis and thirty opposed.

Mr. Wright: I want to ask how many of those who do not want the trellis have used it and have had experience, so they know what they are talking about. There are not many hands going up; I see only six who have used the trellis and do not want it.

Mr. T. T. Smith: I would like to ask if any one has had any experience with commercial fertilizers. I find that barnyard manure is apt to induce too late a growth.

Mr. Jewett: Before my plantation was set out, I had it subsoiled, plowed about eight or ten inches deep with first plow, and then followed it with a subsoil plow twelve to fourteen inches below that. Then the ground was planked level and 250 to 300 pounds of Bradley fertilizer put on and the same amount of nitrate of soda, and I do not see how anything could grow better; they grew way beyond all expectation. Some of the hills were a perfect mass of plants, and I

had to cut them off; they kept growing until late in the fall. My purpose in using this commercial fertilizer was to avoid foul seeds.

Mr. Spickerman: Was it the fertilizer or the subsoiling which did the most good?

Mr. Jewett: I don't know; it was fertilized and subsoiled, so I cannot say.

Mr. Spickerman: I am inclined to think it was the subsoiling that did it, and not the fertilizer. I should think that was just what was needed in that heavy soil.

The President: I think we get better results by not topping the blackcaps. I think in topping them off to induce the growth of laterals they do not get so strong and ripe as they should and do not winter so well, and do not produce fruit so well. This is, perhaps, just my theory in regard to it. I am not so close an observer as to be able to give you all the information you desire, but the result is the main thing we are after.

Mr. Crane: Perhaps Mr. Underwood tops them off too late in the season?

The President: I have not followed up the work enough personally to be able to give you the results as I ought, but I know that our man who has charge of the raspberry fields, in talking with him about it and consulting with him in regard to what we should do and what the results are from one year to another, was of the same opinion I was myself, that it did not pay, that it was better to leave them, and that the laterals did not get the strong growth and maturity that would be got in a single stalk. If you have a number of stalks in a hill, and they are strong and vigorous, you can cut them off in the spring, and you have got as much wood as that hill ought to have; and we would rather have some strong, vigorous canes in that way than to have a lot of weak laterals that we get by cutting them off.

Mr. Kramer: If you want a longer season in picking time, you go to work and cut them off in three different lengths. Cut some quite low, the second a little higher and the third higher still. The first ones will be early, but not quite so good, but the last ones are generally the best crop I have.

Mr. Wright: Our president touched on a valuable point in regard to pinching, or rather not pinching and leaving a few more stalks. You get better fruit by pinching the stalk two and one-half or three feet and your stalk will grow nearly twice the size it would if not pinched. But if you do not pinch, your stalk will be limber and easier to lay down, and by allowing two or three more stalks to grow to the hill you will have just as good fruit as you will have by topping off the canes.

The President: That is just one of the points we wished to bring out.

Mr. Kramer: I think they should not be cut. I have topped them mostly on account of the snow in the winter breaking them down.

THE EVERGREEN HEDGE.

FRED. NUSSBAUMER, SUPT. OF PARKS, ST. PAUL.

The task to prepare a paper on the evergreen hedge in Minnesota from a successful standpoint is perhaps premature, but the few noble efforts made should be encouraged, as they show that by a little intelligent proceeding the evergreen planting in our state can be made effective and our homesteads attractive.

I have noticed that the white spruce, *Abies alba*, is the best of the spruces for hedge planting, not only on account of its density of foliage, but also of its ability to withstand hardship; and it will grow on either wet or dry land. White spruce is a slow grower at first, but after it is fully established will take the lead of all.

The white cedar, *Thuja occidentalis*, is another evergreen hedge plant of superior quality, but it is more particular in point of soil and situation, and while its form of growth is more ornamental it lacks the important qualities of the white spruce, in refusing to grow where the former will.

No fixed rule can be laid down for the successful growing of evergreens, but it is of great advantage to select kinds of the greatest capacity for durability, especially so for exposed localities, and the nature of the soil and the condition of the climate must be taken into consideration. On exposed places or wind-swept prairies, the young planted evergreens need protection and shelter until fully established. There may be failures in growing evergreens, but the right method of treatment will soon be found out. It is not the lack of knowledge as much as it is shortsightedness and indifference. There should be an awakening of interest in planting evergreens on our homesteads. By neglecting this, values to the extent of many millions of dollars are lost to the people of our state. Co-operative and systematic planting would benefit the whole community and would be a pecuniary advantage to all inhabitants of the state. It would create lovely natural scenery around our homesteads, and it would reduce the enormous evaporation from and dissipation of our prairie farm lands.

What is needed most is public sentiment for co-operation. Planting of evergreens, hedges or otherwise, are subject to the same laws of economy as are other improvements on the homesteads, and our vast agricultural resources would be increased thereby. The proper development of the evergreen hedge depends chiefly on the character of the trees planted. They should be neither too tall and thin, nor too short and stout; they must before all things have a fully developed system of rootlets; must be young trees and be of a healthy green appearance. Young trees cheapen the operation of planting and adapt themselves more readily to new conditions. Nursery grown trees are always better for planting, especially in open country; they have more vigor and can stand more hardships than the more tender plants taken out of the forest.

I have heard many complaints that evergreens get winter-killed on open land so that one side (generally the south-facing side) of the tree dies off.

I have studied these matters for five years, as I have lost evergreens the same way. I paid close attention to it and found that whenever the ground froze in the fall without first having had a soaking rain the trees suffered more or less if the sun came out very warm in the month of March, thawing the limbs on the south-facing side, and when the ground was hard and dry, allowing no circulation whatever, the twigs by even a moderate night frost had to succumb. Our native evergreens do not get winter-killed. They are able to stand the cold but cannot stand the unnatural condition of hard, dry soil. They need plenty of mulching to restore as much as possible natural conditions.

I experimented to find out if sudden changes of temperature would hurt evergreens or impair their vitality. I took a tent cloth and covered it over a white spruce which I had transplanted four years ago, and run steam through a hose into the tent, thawing the tree completely. The process took about one hour and twenty minutes. I then removed the cloth to let the tree freeze again suddenly the temperature at the time being twenty-four degrees below zero. I did the same with the white cedar and red spruce, and last summer showed that the experiment during the winter did not hurt them at all, as they were as green and healthy as the others. Dying off of evergreens is caused by exhausted dampness of the soil and by the long winter's evaporation, especially on uncultivated and unmulched ground.

NUTS FOR MINNESOTA.

HON. H. E. VAN DEMAN, PARKSLEY, VA.

The matter of growing nut trees in Minnesota is one which ought to receive the attention of tree planters and home builders there and I am glad to see that Mr. Fairchild of St. Paul is one who is earnest in the work. Lack of hardiness is not so much the obstacle in the way of the successful culture of some species as the shortness of the season. The pecan, of which Mr. Fairchild seems so hopeful, will disappoint him utterly in the matter of mature nuts. They will not ripen anywhere in Minnesota. There are a few varieties that do ripen and even grow naturally in eastern Iowa, but they are small and barely ripen when the autumns are longer than usual.

The little shellbark hickory is perhaps likely to prove the best nut tree for Minnesota. It grows naturally in the southeastern part of that state and will undoubtedly succeed farther north. There are choice varieties, some of which are earlier than others, and if nuts of these were planted they would probably produce other good varieties. The surest way, of course, is to graft from the desirable varieties.

There are early kinds of the chestnut that may probably be grown there, too. Those that have proved hardy at St. Paul should be grafted into little seedlings that may be grown in the state, and the nuts from these hardy trees carefully saved and planted, as will no doubt be done.

The beech is a quite hardy tree and yields very palatable nuts, but they are small. The trees vary greatly in productiveness, and

somewhat in size of nuts. I have gathered quantities of them in northern Michigan.

The butternut is a very deliciously flavored nut, and is hardy farther north than any other nut tree. The hard and thick shell is its chief objection, but there are variations in this regard; and if the best varieties were saved and planted and grafting resorted to, there might be considerable advancement made.

I believe that the Japanese walnuts, especially Juglans cordiformis, will prove a valuable nut tree, even as far north as Minnesota. It is the best of the foreign species and has a very rich but not very large nut.

The wild hazel is a most common shrub nearly all over Minnesota and is too plentiful in some sections to be thought of as a subject for cultivation. But there are great variations in size of nuts and other desirable qualities, and if these were carefully noted and perpetuated, and properly improved upon by the growth of seedlings, there might be a very decided advance made in this valuable nut.

We are only on the edge of a great field of experiment and improvement, and it is the duty of each one of us to add by word and act what we can to the general advancement. This is the excuse which I make for offering these thoughts to my fellow toilers in the far north.

PROFITS OF PLUM GROWING.

NILS ANDERSON, LAKE CITY.

The first of the profit went to the bee-keepers, and I think it was quite a good deal, too, as the plum trees remained in blossom fully two weeks, and the bees worked on them very much. But as the apple trees were in blossom at the same time, and the bees worked on the apple blossoms as well as on the plum blossoms, I could not make any estimate of the profit from the plum trees.

My plum trees bore altogether too many plums, and not taking the trouble of thinning them out, the result was the plums were too small, and they did not ripen up very well, so I did not receive the best price for them. I sold from four trees six bushels of plums at sixty cents a bushel, bringing $3.60. But I think there was some profit, considering the care that the plum trees generally receive.

If my plums had been less in number, and double the size, the profit would have been a good deal larger. The plum for market and for profit must be a good sized plum, no matter if the quality is not so good. Plums are not eaten out of hand in large quantity. They are bought mostly for canning and for jelly, and sugar will make up what the plums are lacking.

I saw some plums at the state fair of very good quality, but they did not have the size for a profitable plum. What we want is a large, meaty plum that can be peeled if desired. A very juicy plum is not a plum for profit, as it cannot be shipped in any quantity to a distant market without wrapping in paper, and that takes some of the profit; if not, the profit is most likely to be gone before the plums reach the consumer. If we could grow a good meaty plum, the size and color of the Orange crab apple, the tree very hardy, we would then have a plum for profit, and if any one has any of that kind I would be very glad to hear from him.

GARDEN FLOWERS—THEIR DEVELOPMENT AND VARIATION.

PROF. WM. ROBERTSON, ST. ANTHONY PARK.

This is a very innocent looking subject at first sight; but when we consider that ordinary flowers, such as asters, chrysanthemums, camelias, pinks, peonies and roses, have been cultivated from time immemorial, that development and variation have been going on all the time; and again that climate, soil, moisture, light, the kind of cultivation, crossing, hybridization, grafting, cutting, layering, division, forcing and selection have had their part in the process; when, in fact, we realize that in a five-minute paper we are to clear up the whole subject of evolution in life and settle the disputes of Darwin and all the other naturalists of the century, we approach the task with a feeling of gratification at the confidence reposed in us and a due appreciation of the magnitude of the undertaking. In other words, we can hope to do nothing more in this five minutes than to mention some of the principles and facts regarding development and variation of flowers.

Plants in their natural or wild state are crowded and have to struggle for existence. They have to settle into the niches left by other plants. Like people under similar circumstances, they maintain a kind of equilibrium but show no special development. This explains the comparative lack of variation and development among wild flowers. Man discovers the increased vigor of the plant which stands alone. He takes up the battle for the plant, destroying undesirable plants, and giving more room and, hence, more food to the desirable ones. This is the beginning of cultivation. Under this stimulus of extra food the settled equilibrium of the plant is disturbed, and development begins.

Next we have the influence of unconscious selection. Seed is naturally selected from the plant most pleasing, and this seed soon will produce offspring having the pleasing quality in a higher degree. As the cultivation rises in quality, the plant in its improved condition increases its variability. New qualities in either foliage, flower or fruit are observed and are likewise strengthened by unconscious selection.

Later, the effect of this selection having been realized by man, he takes up the work systematically, and produces his heart's desire in nearly any flower he chooses. Here is an example: "In 1793 some wild Scotch roses were transplanted into a garden. One bore flowers slightly tinged with red; seedlings from this flower were semi-double, and by continued selection in about nine or ten years eight sub-varieties were raised. In the course of less than twenty years, these double Scotch roses had so much increased in number and kind, that twenty-six well-marked varieties, classed in eight sections, were described by Mr. Sabine. In 1841, it is said that 300 varieties could be procured in gardens near Glasgow; and these are described as blush, crimson, purple, red, marbled, two-colored, white and yellow, and as much differing in size and shape of the flower."

This example gives a hint as how doubling is produced. The cultivation starts the variation; and continued careful selection, always taking seed from those most double, completes the process.

But this continued selection and cultivation for flowers disregards the seed production, and we soon have a plant that will not propagate itself by seed. Having our desired plant, we must find a way to reproduce it. Grafting, cutting, division and layering are the solutions of the problem. So, at present a large part of our most highly prized flower-producing plants are propagated by these asexual methods. These methods allow of the propagation also of many plants which, although they may produce seeds, will not come true from their seeds. Seeds of such plants are sown to obtain new varieties, which in turn are again propagated asexually.

Many new varieties are obtained by what is called bud-variation. This happens when a plant producing a certain kind of flowers develops a branch or branches bearing flowers differing in essential characteristics from the normal flowers of the plant. Here the practised eye and good judgment are useful to detect and to decide whether the variation is a desirable one. If desirable the new feature is preserved and increased by graft or cutting. It is claimed that some varieties resulting from bud-variation become so well established that they may be propagated by seed. However, this is not common. The new characteristics are said also to be strengthened by a proper selection of buds, and by giving the variant part more time on the parent plant.

Flowers on plants reproduced by seeds are often improved by crossing with flowers raised from seeds grown in a different locality. Crosses between closely related species followed by proper selection result in many new and desirable varieties. This hybridization often hastens the flowering period, increases the size of flowers and leaves, and sometimes produces varieties that will thrive where the parent plant will not. Doubling is also sometimes a result of this crossing of species.

There has been considerable discussion as to the influence of the parent plants in these crosses; that is, as to whether the result will be the same when the male parent is selected from one species and the female from another as when the selections are reversed. Experiments in this line are offered to prove both sides. The more recent claim and experiments are in accord with the statement that the relative influence depends rather upon the vigor of the plant than upon the sex. Some hybrids are reproduced by seeds, others by asexual methods. The fixing of qualities in hybrids is sometimes accomplished by breeding with one or the other of the parent species. This attempt, however, often results in reversion to the parent employed.

Permanent doubling in some cases is thought by Kemer to result from the influence of the gall-mite.

Another means of variation needs to be noticed. Listen to Darwin in regard to Adam's Laburnum: "Throughout Europe, in different soils and under different climates, branches on this tree have repeatedly and suddenly reverted to the two parent species in

their flowers and leaves. To behold, mingled on the same tree, tufts of dingy-red, bright yellow and purple flowers, borne on branches having widely different leaves and manner of growth, is a surprising sight. The same raceme sometimes bears two kinds of flowers; and I have seen a single flower exactly divided into halves, one side being bright yellow and the other purple; so that half of the standard-petal was yellow and of larger size, and the other half purple and smaller. In another flower the whole corolla was bright yellow, but exactly half the calyx was purple. In another, one of the dingy-red wing-petals had a narrow, bright yellow stripe on it; and, lastly, in another flower, one of the stamens, which had become slightly foliaceous, was half yellow and half purple; so that the tendency to segregation of character, or reversion, affects even single parts and organs." This tree is claimed to be the result of a grafting between the two species to which it reverts and, hence, is called a graft-hybrid. Although all of our apple trees and many of our roses are propagated by this method, no such effect of stock on cion is ever observed. The stock generally acts simply as a feeding ground for the cion. Graftage may, however, according to Mr. Bailey, heighten the color of flowers.

Forcing often destroys doubleness. Peter Henderson, in his "Floriculture," cites the case of an English firm who, by forcing the dahlia, Beauty of Hastings, to get cuttings to fill their many orders, so reduced the vitality that the plants sent out produced only semi-double flowers instead of the completely double.

In conclusion, we may summarize by saying that the chief part which the average gardener may take in aiding the development and the controlling variation of flowers, is in improving his cultivation, and selecting his seed with care, choosing with reference to the quality of plant as well as of the seed, always having an ideal of beauty in his mind toward which he is to select and work.

LIKES THE CHANGE.—I have wondered if all the members are as well pleased as I am over the change in the program which drops the evening session. For my part I have enjoyed this arrangement very much.—Mr. Clarence Wedge.

A CONVENIENT PRUNING DEVICE.—If one could stand upon the ground and reach all parts of the tree that needs pruning, much more of this necessary work would be done. If pruning is attend ed to yearly, there will be very few large limbs to cut off. An excellent device that will prove very effective for all small limbs is to fix a sharp, broad chisel firmly to the end of a pole, long enough to reach all parts of the tree, but light enough not to prove cumbersome to carry and handle. A simple push with the hands will cut off all small branches, but as for those a little larger, a blow on the lower end of the pole with a light mallet, that is hung over the shoulder, will sever them from the trunk. Another excellent device is a similar pole to the end of which a narrow saw has been fitted, a saw no wider than the blade of the chisel. With this one can reach the highest limbs from the ground and saw them off.

WHAT PLACE HAS GRASS IN AN ORCHARD?

A. K. BUSH, DOVER.

This question is asked with the express understanding that grass has a legitimate and recognized place in the orchard, and I am asked to locate the position it should occupy. Now, that depends very much on the age of the trees, the soil, the lay of the land, &c.; also, if your object is to grow an orchard with the least amount of labor and expense, regardless of results—sort of a lazy man's orchard—then turn it out to grass as quickly as possible after planting; but if you desire the best results, keep the grass away from the trees. If the land is too steep to cultivate without danger of the soil washing away, then grass must be allowed in order to retain the soil, otherwise we should not give it a place until the orchard comes in bearing and then limit its position.

Grass as a "catch crop" recommends itself to many fruit growers and most farmers as one easily and cheaply managed, saving the expense of hoeing and cultivation and is not regarded by them the best, as experience with other crops which require clean culture prove them much superior and more profitable.

The tillage they require is just what the trees need to insure a healthy, rapid and well developed growth, also to conserve moisture in soil and to protect trees from ravages of mice, vermin and the thousand and one enemies of successful orcharding in the form of germ and parasite life which are at home in the grass. These pests, which make fruit growing a constant and expensive warfare in some sections of the east and south, are coming to us with nursery stock from those infested districts, being sold to our planters in large quantities annually by those swindling fruit tree pirates from abroad, who buy anything which can be bought cheap and sell everything regardless of name, quality or past history. They come and go in gangs; most of us know them to our sorrow and loss. We should treat those fellows, having failed in securing desired protective legislation, as Will Carleton's "lightning rod dispenser" was entertained. After being swindled, that famous poet said: "If any of those fellows want a dinner dialogue with the restaurant department of an enterprising dog, let him set his mouth a-running just inside my outside gate, and I'll bet two hundred dollars that he don't have long to wait." These robber "tree sharks," with their worthless, infected, lousy stock, are pulling down the horticultural interests of this state nearly as fast as our society can build it up. (We admire and respect a conscientious tree peddler.)

A few suggestions as to how I control grass in the orchard: With young plantings, cultivate on either side of the row of trees about once a week from early spring until June 15th, when beans can be planted on each side of the row, also one row in line with the trees, planting thickly in drills and using plenty of seed. Near the trees rows should not be more than two or three feet apart. The beans will germinate quickly and grow very rapidly, and soon shade the ground entirely, keeping the same cool and moist; also will twine about the stocks of the trees, protecting them from the in-

tense heat of the July and August sun. The early and continued cultivation before planting will destroy nearly all weed seeds in the soil, so that further cultivation or hoeing will hardly be necessary after the beans are harvested, which should be done as soon as the pods color. The trees may be mulched with barnyard manure, allowing it to remain until spring, when it should be spread on the cultivated space.

This is an ideal way of growing apple trees and beans. Try it and be convinced. The beans grown this year, after this manner of planting, more than paid the entire expense for labor in my young orchard of about 2,000 trees, and I have the beans in addition to a clean, thrifty orchard.

After my orchard comes into bearing I shall use it as a hog pasture, allowing grass, which should be clover, to take full possession of the ground; mulching the trees instead of cultivating, which should be done in July, to protect the roots from the extreme heat and drouth of summer and autumn. It is understood that hogs (with bristles) are not allowed in the orchard while fruit is maturing and not until gathered. When they return in their search for apples and exercise on the mulch, they will become self operating cultivators, working the mulch into the soil, destroying the grass and sod near the trees, eating wormy apples and otherwise benefiting the trees. I have an orchard of about 250 apple trees on my stock farm, mostly crabs, which were bought of our mutual and honored friend, Wm. Somerville, twenty years ago, and planted especially for a hog pasture. It was an experiment with me but proved to be a grand success and a profitable investment of time and money. I would recommend such plantings.

Clover is the grass for an orchard and makes an ideal mulch when used green. Like beans, it absorbs nitrogen in large quantities leaving much of it stored in the soil, which is an element needed as a plant food, but found only in limited quantities in most soils.

In conclusion, I understand this to be no time or place to present theories or work personal interests. Neither are we expected to supply entertainment with literary productions only, with our best thought engaged in preparing papers which shall *sound* well and possibly furnish little instruction and no practical, tested methods or experience. This society is the horticultural schoolmaster of our commonwealth, and we its recognized instructors. Practical teaching by men of experience, expressed in plain language, which shall carry with it a store of valuable instruction all over this Northwest country in our magazine and annual reports—I believe this to be the thought of our program committee and the demand of our state, made famous by producing the best of its kind. Let that continue to be *our* product!

Mr. Dartt: I think in drouthy countries clean cultivation is the rule. Seeding down to clover would, perhaps, be bad policy in such places, and I doubt whether it is a good policy for orchardists anywhere to follow that. The clover must necessarily draw a good deal of moisture from the ground in its growth, and it would rob the orchard of the very moisture it needs. I believe it is the custom in

drouthy countries to cultivate thoroughly and clean, allowing nothing to grow among the trees.

The President: This is a very interesting feature of our work. Our friend Oliver Gibbs has been having quite an experience in South Dakota, and he has taken a back seat and not shown himself at all; I would like to know what his opinion is about mulching and cultivation. Will you tell us, Mr. Gibbs, what your preference would be?

Mr. Gibbs: Southeastern Dakota is not so bad as some may suppose, and I presume it is the finest country to which a man can go. It expresses my idea exactly that there should be nothing allowed to grow in the orchard except trees and, I would add, during the entire season. I would keep the ground clean until I could cultivate no longer. I have never seen an orchard that was mulched in which the mulching took the place of cultivation, that is, where mulch was used as a substitute for cultivation, without any cultivation. I thought Mr. Somerville's orchard was only mulched and not cultivated, but I found I was mistaken in regard to that. He does not use mulch in place of cultivation, but he places his mulch in the orchard and then turns in his hogs the next spring and the early part of the season, and they give the orchard the most thorough cultivation you could imagine. In reply to a question, he stated that the hogs put the ground in the best possible condition, and the orchard looks as though it had been put in that condition by very thorough cultivation instead of by mulching. If the soil is properly prepared and the planting properly done, I think in dry regions there is no occasion for mulching whatever. If the roots go down where they ought to go, and where they want to go, and where they will go if the sub-soil is properly prepared for them, a dust blanket which is produced by thorough and frequent cultivation is all the cultivation they want. There is no danger from root-killing if the roots are down where they ought to be. That is my idea. The place for grass in an orchard is on some side hill, where the soil will wash, and where in the early life of the orchard there must be some cultivation for the early benefit of the tree. My own orchard was in a situation of that kind. It was so steep I could not plow it, and I allowed the grass to come in and protect that side hill from wash, and then around each tree I kept a circle clean—I kept it thoroughly clean for seven or eight years, widening the circle gradually as the trees grew, until I had a circle the average width of which was about eight feet, and the rest was in grass.

Prof. Green: I would like to speak a few words in regard to the subject of the place of grass in the orchard. I believe that grass or some such crop is certainly very desirable in an orchard. I believe that those people who come in here and tell you that there is no place for grass in the orchard are talking about something they have not tried long enough to get results. I have had some experience in the older sections of the country where they have tried it. I refer to New York state and some other eastern states. My reason is just this: Mr. Van Houten referred to the fact that results discounted theories, but a good theory is the first essential to a successful practice. You take a piece of land and expose it to the sun and winds,

and to heavy rains, and you will find it will not hold water; it will wash all to pieces. In Mr. Gibbs' condition in South Dakota, it would work all right until the humus is worked out of the soil. We have not got the loose loam in this part of the state as they have it in Iowa. On this kind of land I believe it is absolutely necessary to grow something to furnish humus, and I do not know of any crop that is better than clover. The roots grow deep into the soil and bring about a better condition of the soil; they loosen up the ground. Anybody who has had any experience knows that there is no land that gets into much poorer condition than land on which nursery stock is grown. You have taken out every single thing there is in the land, and the result is that the soil gets to be a kind of mineral soil, without any organic matter in it. I think with new soil it would take all right for a while, but the time will come and has come on poor soil, when we shall have to grow something to furnish humus to the soil. What has been said about cultivation for the purpose of retaining moisture is perfectly true, but that is not the only thing to be taken into consideration in the successful life of an orchard.

Mr. Somerville: I think I have raised apples in Minnesota about as long as anybody in the state except Mr. Lord. About the first apples that were shown at our state fair were grown by me, and the tree I grew them on is there today in a block of fifty, and I have not put a cultivator into them for twenty-five years My method was to cultivate them thoroughly until they came into bearing, and I have practiced that ever since. As soon as they come into bearing I seed the orchard down to clover, and then I make a pig pasture of that orchard, and my trees are mulched every year. I draw out the mulch during the time we have snow every winter and retain all the moisture in the ground I can through the summer, and then I put my hogs in there. I have a tight fence around the orchard, surrounded by an evergreen hedge, and I make that my hog pasture exclusively. I put rings into the noses of the large pigs so they cannot dig out the roots, and then the little fellows cultivate so much cheaper and better than I can do it that I give them the job every time—and that plan has been very successful. In the block I set out in 1862, there were fifty trees, and forty-nine of them are living and bearing fruit. I have got fruit for thirty-two years without losing a crop.

Mr. Burnap (Iowa): How many years have you been turning those hogs into that orchard?

Mr. Somerville: For twenty years.

Mr. Burnap: Have you ever experienced any bad results?

Mr. Somerville: I never have. The results have always been good. I leave them in there and do not take them out until after the windfalls—the hogs devour them; then I turn them in after fruit time, and they are not educated to spit out the worms.

Mr. Burnap: I am doing the same thing in half of my orchard.

Mr. Dartt: I am not satisfied to leave this thing as it is. The grass men have had the advantage, they have had the last shot. I want just a minute, and then I want my Iowa friends to have an opportunity. I want to speak just for the good of the orchardist. I

was down in Iowa a few years ago as a delegate, and in listening to their discussions in regard to orcharding I found that all of the most successful orchards had been cultivated, or else they had been used for feeding lots, which is equivalent to cultivation. Now Somerville cultivates; he says he does, and I do not think it should go out as the sense of this meeting that grass in the orchard is the proper thing or a necessity. I think the theory is all wrong, and I think the experience of the people is to that effect, especially the experience of Mr. Somerville. Cultivation is the thing, and you cannot get anything else that is equal to it in the case of the orchard. I do not want to consume time unnecessarily, but I don't want this grass theory to go out among the orchardists of Minnesota. They are inclined to lean that way anyhow, because it is easier to let the orchard grow up to grass. (Laughter).

Mr. Van Houten, (Iowa): I want to concur with the statement made by Prof. Green, that there is a necessity for more humus in the soil, and I think clover is one of the best things for that purpose, but I think buckwheat is better than clover.

EVERGREENS THAT SUCCEED IN MINNESOTA.

PROF. W. W. PENDERGAST, HUTCHINSON.

Prairie homes without trees to give a softening effect look bleak and uninviting. The few deciduous trees that are scattered here and there do but little in the winter to relieve their barrenness. In the villages, evergreens add to the attractiveness of the scene, both in summer and winter. They tone down the angularities of the home, give denser and cooler shade, and, by their seeds, draw to their branches birds for which deciduous trees have no charms.

The desirability of such trees is admitted, but most of the attempts to grow them where most wanted have proved failures. The blame for this has been generally attributed to the severity of our winters, notwithstanding the fact that evergreens successfully resist the intense cold of the Arctic regions, where the thermometer not infrequently indicates a temperature of 70° to 80°. The fact is that the various Minnesota and eastern spruces, firs, pines and cedars, which we have tried to *domesticate*, would have no difficulty in withstanding the cold of our winter season, but our dry falls do not furnish sufficient moisture for the roots; hence, death comes before spring, with its melting snows and frequent showers, has time to avert the evil. Evergreens are not the only trees that suffer from this cause. It often happens that soft maples, box-elders, cottonwoods and, sometimes, even elms, die from loss of sap and consequent seasoning of the wood, when a sharp drought has continued from August until November, and winter has followed hard upon it.

But what difference does it make with us, who are trying to ornament our grounds with trees that will do something toward relieving the ghastly whiteness of the winter landscape, whether the dryness of the autumn or the cold of January foils our efforts? The first duty of the physician is to diagnose the patient's disease and deter-

mine its cause. This done, he is ready to set about its cure. If I have properly diagnosed the ailment of the evergreens, we must look for a remedy along other lines than those we have been pursuing. We must select for planting, not in the very cold and the very moist regions, but where the atmosphere is dry and the soil arid, among those varieties that, in the course of hundreds of generations, have gradually adapted themselves to their environment. Such trees would, at the outset, be prepared to meet and to withstand the conditions that have proved so trying to those with which we have so long experimented. Up to this time, most people, in selecting trees, have looked at the various kinds, or at pictures of them, and have picked out the ones that happened to strike their fancy, without reference to their native habitat, with the result that ought to have been expected.

By adopting the theory set forth in this paper, all the spruces firs, arbor vitaes, hemlocks, white, Austrian and Norway pines between the Mississippi and the Atlantic, would have to be excluded. These are the ones which have been most generally chosen and which have done so much to discourage farmers and amateur horticulturists from planting evergreens at all. These trees are by no means to be condemned as unworthy of trial anywhere in the state. On the other hand, they are very satisfactory in soils that have great drought-resisting properties. But it is not of such soils that I am talking, since no complaints of failure have come from those places. The trouble is with the arid, wind-swept prairies and with lands on which the grass dries and turns brown during August and the autumn months, when there is little precipitation. The trees named are not suited to these localities, while the Riga (Scotch) pine fairly revels under such conditions. I take hold of no other tree with such confidence. If transplanted carefully and watered freely, so as to wash the soil around the roots, thus bringing every fibre into close contact with the moist earth, it will become established at once in its new place and will make a satisfactory growth the first season. The soil should be pressed down firmly about each tree, and mulch enough used to keep down the grass and weeds till the shade of the tree is sufficient protection. This simple treatment will insure a growth that few, if any, deciduous trees will surpass. It does its work early in the season. The season of growth is only about forty days, beginning the last of April and ending during the first days of June. Then it ripens its wood, folds its arms and takes a good rest, preparatory to another season of vigorous growth the next spring. I have known the leading shoot to grow an inch a day for two or three weeks, without a halt. To my mind, it is superior to the geometrically symmetrical spruces and firs as an ornament for the lawn or the landscape. An object that is beautiful and attractive by itself is not always attractive in combination with others. The pine has more freedom and less stiffness than the perfect cones admired by so many for their regular proportions, and it harmonizes better with other trees and shrubs around it.

The red cedar,or juniper,is another tree that gives very satisfactory

results in soils not moist enough for firs and spruces. The turning brown of the leaves in the winter is undesirable, but, in the spring, summer and fall, the delicate, feathery foliage is very beautiful, and the tree presents a decidedly graceful appearance. It succeeds in almost any dry soil where the trees usually planted fail.

For hedges and clumps of greenery, nothing is better than the dwarf mugho pine. It is perfectly hardy and bears transplanting well. I have not lost one tree out of a hundred in re-setting, and out of five hundred have not had one die a natural death.

Experiments with the Minnesota jack pine have been so far favorable, but my experience with it has not been very extensive.

Some of the most promising evergreens come from the dry plateaus of the Rocky Mountain states. Among these are:

Abies Concolor. Finest and most attractive of all; blue in color; hardy, except that the lower limbs, in the trying weather of early spring, become discolored and sometimes die.

Douglas Spruce. Vigorous, symmetrical; new growth of a soft light-green color.

Colorado Blue Spruce. Very dense; silvery blue foliage; rapid grower, and one which bids fair to prove satisfactory.

These Rocky Mountain trees are, as single specimens, highly symmetrical and universally admired and, to my mind, are more desirable when standing out alone than when in clumps or mixed in with other trees, with the idea of securing a beautiful, harmonious and artistically complete whole.

AN INGENIOUS SAFEGUARD AGAINST FROST.—George A. Fleming, a fruit grower of Visalia, Cal., has devised so ingenious, simple and efficacious a scheme for protecting orchards from frost that it should be known as widely as possible. It should be borne in mind that frost occurs only when the air is still. Hence, fires built around an orchard will send their heat and vapors straight up into the air, while building them among the trees would be dangerous.

Mr. Fleming, after various experiments, hit on the following plan. He thus describes it: "We built wire frames on our low truck wagons, stretching them from four wagon stakes and heaping wet manure over them. Dirt was thrown on the wagon beds to protect them, and pots of burning tar were set underneath the straw roof. A barrel of water on the wagon was used to keep the straw wet. These wagons were driven about and did the best work, as they could go wherever most needed. The smoke and vapor were carried to the rear as the wagon moved and, being at once out of the rising heat, fell close to the ground in a long white trail. At daylight our whole 400 acres of orchard was covered with a white fog extending from the ground about twenty feet high."

That seems to be a perfect solution of the problem. The wagons may be driven among the trees or anywhere else, and the blanket of vapor left behind is a sure protection against frost. The idea is economical, the question of fuel being one that every grower can answer for himself.—*Call.*

Calendar for August.

PROF. S. B. GREEN, ST. ANTHONY PARK.

It is very desirable to stop the deep cultivation of crops by the first of this month, at least in the case of trees; but it is a good plan to continue shallow cultivation, so as to prevent excessive loss of water from the soil and keep down weeds. Wherever practicable, the annuals should be kept cultivated, and in the case of strawberries, also, cultivation should be carefully continued during the whole of this month. The marketing of apples and plums comes in this month, and the outlook is exceedingly good for good crops and fair prices. In the marketing of these fruits, as in the case of all others, it is most important to get the fruit before the purchaser in good condition. Some of our horticulturists will have a crop of apples and, perhaps, a crop of plums for the first time in sufficient quantity so that they will be obliged to secure a distant market for them. If this is the case, arrangements should be made for marketing them at once, and in the selection of a package in which they are to be shipped it is always advisable to consult the wishes of the dealer who is to handle them. Very often apples are seriously injured by being packed in barrels without suitable pressure having been applied to hold them solid. It is almost folly to ship any variety of apples in barrels, and especially such tender skin sorts as the Duchess, without pressing the heads in with a barrel header. I have seen very many apples in this market that were worthless from the neglect to take this precaution. If blight has occurred in the orchard, the blighted wood should be cut off as soon as may be and burned.

The old fruiting canes should be cut out of our raspberries and blackberries if they are to be laid down in the autumn. If they are to stand without covering over winter, I do not think it is desirable to do this, as these canes furnish some protection. By the last of the month or the first of September, currant cuttings from most of the varieties can be set to best advantage, and if the work is properly done at this time they should have nice roots on them by the time winter sets in.

If the present drought should continue, it may be desirable to water some apple and plum trees that are very heavily loaded, as such treatment not only adds to the hardiness of the tree during the following winter, but it generally results in an immediate increase in the size of the fruit.

The flowering plants which are to go into the dwelling house this winter should be carefully attended to and not be allowed to become dry or pot-bound. From the middle to the last of the month, the chrysanthemums which have been planted out in the garden will begin to show flowering buds, when they should be potted off for

flowering in the house during autumn. It is not too late now to take off geranium cuttings for winter flowering, but it would have been much better if this had been done last month. Seeds of nasturtium, candytutt, mignonette and other desirable annuals for winter flowering, should be sown by the middle of this month in order to do well during winter. At this season of the year most of our perennial plants are out of flower, and we have to depend upon our annuals for flowers. The hardy hydrangea, however, is one of the few perennials that flower late in the season, and by the middle of this month it will be in its glory. The original form of what is known as the large flowered hydrangea is now in full bloom with us.

SQUIBS FROM THE WINTER MEETING.

THE EXHIBIT AN OBJECT LESSON.—I think it is a source of education, as well as pride and gratification, that any one who wishes to see the varieties of apples recommended in the fruit list can step into the other room and see just what the kind is that is recommended.—Mr. T. T. Smith.

WE SHALL RAISE APPLES.—I want to say that the first meeting of the State Horticultural Society I ever attended was after the severe winter of 1884–85, when I became convinced that the production of apples for commercial purposes was impossible in Minnesota. But I am now a converted sinner. (Laughter.) Minnesota is not going to raise apples in a small way, but will raise apples in a commercial way, and the credit is due to those men who have carried this society through to a successful issue. (Applause.)—Mr. D. R. McGinnis.

IMPROVE THE SCHOOL YARDS.—There was one thing in my mind last winter in regard to getting work done in school yards that we might take up with profit. I think we can do some home work in the horticultural line, if we only look around us. I was in one town last summer where in a school yard they dug up an old oak tree and put in some box elders. They went to work and cleaned out the bur oaks and put in the box elders. There are many other instances of the same kind where we could do some effective work.—Prof. Wm. Robertson.

HOW TO GET MEMBERS.—There is one thing I want to call the attention of the members to, and that is to make an effort to secure subscribers for our magazine, which carries a membership in the society with it. It is a very easy matter. To secure a member, it is only necessary to show him Prof. Green s Amateur Fruit Growing, and also the premiums which are described on the inside page of the cover. You simply show the combination. I secured a dozen or fifteen members, and did not go out of my way to do it, and it is worth a good deal to the society. If a little effort was made in our individual neighborhoods I think we could double the membership the coming year.—Mr. A. K. Bush.

Secretary's Corner.

APPROPRIATION FOR P. M. GIDEON'S EXPERIMENT WORK.—In accordance with the resolution adopted at the late summer meeting of our society, the executive board appropriated $100.00 to assist Mr. Gideon in his work, and it was sent him later and its receipt appropriately acknowledged. The horticulturists of the northwest fully appreciate the value of Mr. Gideon's service to pomology, and we are glad to have this opportunity to show it in so practical a way.

THE RUSSIAN APPLE NOMENCLATURE NEEDS UNTWISTING.—An effort is being made to secure at the next LaCrosse fair, which meets the last of August, a meeting of a joint committee from the state horticultural societies of Iowa, Wisconsin and Minnesota to try and secure more uniformity in the names given to Russian apples now being cultivated in the northwest. There is some probability this may be brought about. Messrs. Clarence Wedge, S. B. Green and J. S. Harris were selected to represent this society on that occasion.

MORE ABOUT MUSHROOMS.--Those of our readers who are interested to continue the study of mushroons along the line suggested in the paper on this subject by Dr. Whetstone, published in the last number of this magazine, would do well to send to the U. S. Dept. of Agriculture for Bulletin No. 15, Division of Vegetable Physiology and Pathology, on "Some Edible and Poisonous Fungi." This article is well illustrated and describes in ordinary terms very clearly many of the commoner varieties of both classes of mushrooms. It will be found a convenient and safe guide if you would 'eat and live."

STORE EARLY FRUIT FOR THE STATE FAIR.—Arrangements have been made, as in previous years, for placing in cold storage for exhibit at the state fair, any fruit that will not keep well under ordinary conditions at home. Shipping labels to be used for this purpose will be furnished free upon application to Secretary Latham, 207 Kasota Block, Minneapolis, and needed directions furnished. This storage will be without expense to the exhibitor, and all the fruit so stored will be delivered at the state fair early Monday morning at the opening of fair week. The free use of these facilities will greatly reduce the labor of preparation and transport of fruit to the fair, and our exhibitors should avail themselves of them. Try them and see the advantage.

TAKE YOUR FRUIT TO THE STATE FAIR.—On page 42 of the 1898 Minnesota State Fair premium list will be found the fruit and

flower department. Read it over carefully and see if there is not something growing on your place you can exhibit. If you show the best you have, you will be surprised to find your things are as good as other people's, and the premiums you will take will repay you well; besides, it will do you lots of good to meet for a time those interested in a common cause. Two of the older exhibitors, whose faces have been familiar at the state fair for many years have died during the past year, and many are growing old in the service. Others must come in to take their places and fill up the ranks. If you have anything in our department, bring or send—even if you never have before—and you will be cordially welcomed and find a new pleasure.

$150.00 PREMIUMS FOR SWEEPSTAKES APPLE EXHIBITS AT THE STATE FAIR.—This large sum should insure a number of fine exhibits, including every species and all the valuable seedlings growing in the state. Please note that the plan of dividing the premiums insures every exhibitor a premium. For description of this offer, see page 43, of state fair premium list. It will repay your careful perusal, especially if you live in an apple growing region. Prospective exhibitors for these premiums are requested to notify Sec'y Latham at an early day as to the number of plates likely to shown, that adequate space may be secured; otherwise there may be disappointment in this particular. A sufficient number of labels will be sent to each applicant for use on the plates, as required by the rules.

TROUBLE IN THE HEDGE AND WIRE FENCE COMPANY.—According to late press dispatches several suits have been begun against this company by those farmers who have bought stock in it, because they have not gone ahead, as expected, and demonstrated by planting miles of it that the system is a success, the seed furnished for this purpose proving a failure. It will be remembered that our opposition to this scheme was based upon the fact that the plant to be used, the honey locust, is not sufficiently hardy to make an enduring fence in most localities of this state. Something might be said also as to the advisability of a hedge fence at all, but this phase has not been considered. This is a good opportunity for the planters of the state to take second thoughts and note again the attitude of this society on this subject. It is probable the buckthorn or some other hedge plant might stand here for such a purpose, if you want a hedge fence, but experience has shown the honey locust to be unreliable.

STORE FRUIT FOR THE WINTER MEETING.—While preparing for the state fair, do not overlook the regular show of fruit for our winter meeting, to be held the first week in December. You will do well to send all the fruit intended for exhibition on that occasion to the cold storage provided here. (Send to Secy Latham for shipping labels and directions.) This storage will cost the exhibitor nothing, and the fruit will be delivered, without cost, also, at the place of meeting. The exhibitor has only to gather and pack the fruit, take it to the express office and prepay the charges to Minneapolis, and

without further expense or trouble to himself it will be delivered to him at the place of meeting. As the storage is very cold, almost to freezing, any kind of fruit not over-ripe and carefully handled and picked—even plums—should come out in good condition. A liberal premium list will be prepared to repay you for all the trouble—and, besides, we want the finest show of fruit at the coming session we have ever made. Please notify the secretary of any shipments and about the number of plates. Heretofore some of the exhibitors have sent back to cold storage for the winter meeting the fruit they exhibited at the state fair. This practice is unsatisfactory in that the fruit cannot come out in good condition after so many changes and so much handling. Much better results will be obtained (and more premiums earned) by storing in separate lot for the winter meeting, and the expense and trouble to the exhibitors has been reduced to a minium that they might do this. Of course, in the case of one having no other specimens, it is sometimes absolutely necessary to exhibit the same fruit twice.

STARTING PLANTS IN SODS.

Lima beans, squashes and melons do nicely by starting them in sods. Take some close cropped turf from a rich pasture, cut it to fit a strawberry box and, reversing it, place it in the basket, and loosening up the soil, mix in some superphosphate or rich compost and sow the seed. The seed should be sown about six weeks before it will be safe to place the plants in the open ground. The hardening off, that is, inuring to outdoor conditions, is a very important part of spring plant management. Two weeks before the time to finally transplant, place the plants in a shallow trench out of doors, having a rim of boards high enough to secure head room for the plants. The soil taken from the trench should be banked around the rim. A tight board covering at night will protect from frost and such a cover may be cheaply made by taking dry goods boxes, cleating sides and top and bottom, so they will not fall to pieces, and sawing them off close to each end. This will give six covers which will serve for a cold frame 28 inches wide and 16 to 20 feet long, according to the size of the box, and a box will not cost more than 40 or 50c. In nights when there is no probability of frost, the covers may be left off.

Thrifty growth, frequent transplanting, and careful but thorough hardening are the secrets of strong, early, tough vegetable plants. It is always desirable to put in plenty of seed, as they seem to come up much better than when sown thinly. A certain amount of heat is engendered in sprouting, which helps the temperature of the soil, and the plants are of mutual benefit in cracking the soil, just as many hands at the raising of a building makes light work for all. The most advanced plant growers do not now water upon the surface but have a shallow tank in which the flat box of plants is set until the soil is thoroughly saturated. This prevents baking and washing of the surface.—*O. J. Farmer.*

ANDREW PETERSON (Waconia, Carver Co.) AND HIS LIEBY APPLE TREES.
(See Secretary's Corner).

THE MINNESOTA HORTICULTURIST.

VOL. 26. SEPTEMBER, 1898. No. 9.

HORTICULTURISTS AND GOOD ROADS.

A. B. CHOATE, MINNEAPOLIS.

(Address before the Horticultural Society at last annual meeting.)

I feel almost like apologizing for interrupting your program in which you are so deeply interested, and also because being a lawyer and a city man you may feel like I did when I was a boy in the southern part of the state; I used to think it was kind of presumptious for a city man to come into the country and tell us farmers how we should vote. I have never done that myself; I have never gone into the country to make political speeches. This is a subject that is a hobby of mine, and while it may not be a hobby of yours, still you ought to be interested in it. I have not only been a farmer, but I was a nurseryman, and for two years I represented a nursery firm. I did not buy anything outside of the state. My experience may be illustrated by a little story that I once heard. A man was on the witness stand being badgered on cross-examination by a lawyer. He had heard that the witness' father had been in jail, and he wanted to bring that out to disgrace the witness, and he asked him if it was true. The witness objected to answering the question, and appealed to the judge. The judge told him he must answer the question. He said his father started out a very honorable man, but he had had bad luck, had lost his crop, finally lost his farm, got discouraged, became a tramp, and thought he would take enough to get out of the country with and start a new life, but the sheriff caught him and put him in jail. The lawyer asked, "Where is he now?" The witness did not want to tell, and appealed to the judge. The judge said he must answer the question. He hesitated a long time, and then he said at first his father had been a farmer

and an honest man, then he turned tramp and was sent to jail, and the last he heard of him he was practicing law in Texas. (Great laughter.) I do not know that I need to apologize for practicing law, but I want you to understand that I have not always been a lawyer.

I have addressed many different kinds of associations upon the subject of highway improvement but have never addressed one which seems to me should be more actively interested in the question than this association. There are two principal reasons why you would naturally be more interested in this question than agriculturists generally.

The first reason is that you are a better educated class of men than the average farmer is, and it is always to the more intelligent and educated that we must look for an appreciation of any good thing. For fear that you may think that I am trying to flatter you, I desire to add here that I consider flattery a sort of flapdoodle which pleases none but fools, and no one but a fool would offer it to an intelligent audience, and to further convince you that I don't mean to flatter you, I will say that while I think you more intelligent than the average farmer, I do not think you are the most intelligent audience I ever addressed. I had the honor of addressing the Minneapolis City Council once (Laughter), and they have all been bright enough to keep out of Stillwater, which is saying a good deal if half that is told about them is true (Laughter). Of course this remark does not apply to our honored brother, Elliot. It requires no particular brilliancy for such men as he and I are to keep out of jail. Seriously speaking then, this is the principal reason I expect you to be interested in this subject.

The second reason is that operating in the country as most of you necessarily do, you are obliged to use the highways in your busines. Your products are of a perishable character, as we say in law. That is, they spoil quickly and become unmerchantable. It becomes important then that you should not only be able to take a large load to market, but if the road is not reasonably smooth the jolting will injure your crop on the way. Not only do you need to haul a large load without any more jolting than necessary, but you need to go to market quickly. Nor is this all. A road may be such that part of the time you can haul a large load quickly and smoothly and yet the road become bad when you need to use it most, just when you have a large perishable crop on hand. You cannot afford to have the marketing of your crop depend on so uncertain a thing as the weather. A farmer can put his wheat in the granary and wait until the roads dry up. He may lose considerable on the price, it is true, but you not only lose the high price but your whole crop besides if the road becomes impassable when your crop is ready for market. This is particularly true in Minnesota where the greater part of the horticulturist's crop consists of fruit and vegetables which will not keep.

The same is especially true of the dairy business. All the talk of all the reformers in the country has not done so much to impress the importance of good roads upon dairymen as has his personal experience going to market every day in the year with his milk, rain or shine, mud or no mud. So, while I have the impression that the average intelligence of horticulturists exceeds that of the average dairyman or farmer, the fact is, it does not require very much intelligence to see the need of better roads when a man is forced to use the roads in all kinds of weather. Horse sense is all that such a man needs to appreciate the importance of good roads, and on the whole it is probable that horses appreciate the difference between good and bad roads better than their drivers generally do.

There are two very good reasons then why you, as horticulturists, should be especially interested in the improvement of country wagon roads. Assuming, then, that argument is unnecessary to convince you of the importance of better roads, I will pass that phase of the question and briefly discuss that which bothers us all more than anything else, namely,—how shall we pay for better roads? An hour's talk would not exhaust this question, and as I have but ten minutes more I will confine myself to one phase of the question only, namely,—state aid.

UNEQUAL TAXATION.

It seems strange that the farmers and the people from the country generally have not demanded a more systematic aid from the state for building country wagon roads.

We have a provision in our state constitution which reads as follows: "All taxes to be raised in this state shall be as nearly equal as may be; and all property on which taxes are to be levied shall have a cash valuation, and be equalized and uniform throughout the state." Now that provision of our constitution means that one man shall not pay any more tax in proportion to the value of his property than any other property owner in the state. This principle of taxation has been so well impressed upon our minds that we apply it and insist upon it in the ordinary methods of taxation as a matter of course: for example, if you own a farm adjoining that of your neighbors, and his farm is worth just as much as yours is, you insist that his tax shall be just as much as yours. This is elementary, and yet property owners in the country consent to a violation of that principal continually. We all know that the agitation for improvement of the country wagon roads originated in the cities and has been chiefly supported and kept alive by city men. The natural inference is that the cities will be benefitted by better country roads. You are not simple enough to suppose that these city men are agitating this question so much from purely benevolent motives. The fact is that it is admitted by the best informed people that the cities will be nearly, if not quite, as much benefitted by the improvement of country wagon roads as the country people will be.

The New York Chamber of Commerce says: "We are handicapped in all the markets of the world by an enormous waste of labor in the primary transportation of our products and manufactures,

while our home markets are restricted by difficulties in rural distribution which not infrequently clog all the channels of transportation, trade and finance," and it this keen appreciation by the commercial and manufacturing classes of their own losses by bad roads that makes the cities and towns so ready of late to help the farmers in making good ones.

Now, in connection with this idea that the city people want the country roads improved, you should bear in mind that the bulk of the wealth of this country is in the cities. In Minnesota considerable more than half the taxable property is in the cities and villages. In the state of New York only 7% of the state tax is paid by the farmers. This proportion varies in different states, but the tendency is continually to increase the wealth of the cities in proportion to that of the country.

This being true, why should we not apply the same principle as between the owners of property in the country and in the cities which we apply between two owners of adjoining farms? Is there anything more reasonable than that the city people should help to pay the expense of an improvement which is largely for their benefit? Does not this principle of equal taxation prohibit the burden of improving the country roads being cast upon the country people alone? The people in the country surely ought not to object to requiring the city property to bear a portion of the expense if the city men do not. It is not a new principle of taxation, then, which we are urging but simply the application of an old, well established one.

Neither is the application of this principle in this way anything new. Lord Macauley in his English History, describes the condition of the roads in England in the seventeenth century, and the description which he gives is a true picture of the situation in nearly every state in the United States at certain times of the year. Mr. Macauley observes that one of the chief causes of the badness of the roads was the defective state of the law which required each parish to repair the highways which passed through it, by the gratuitous labor of the peasants six days in each year. Mr. Macauley then observes, "that a route connecting two great towns, which have a large and thriving trade with each other, should be maintained at the cost of the rural population scattered between is obviously unjust." He says that a change, however, was finally effected, but not without great difficulty, "for unjust and oppressive taxation to which men are accustomed is often borne far more willingly than the most reasonable impost which is new." An effort is now being made all over the United States to make the change in regard to taxation for roads which Mr. Macauley says they had two centuries ago in England, because "unjust taxation to which men are accustomed is often borne far more willingly than the most reasonable impost which is new."

Neither is the principle of state aid new in the United States. In the early history of United States, at a time when the tendency of our government was to limit the functions of the general government more than it is now, it was considered necessary to the enjoyment

of life, liberty and property that wagon roads should be built by the general government, and in that period (when the government was limited to such matters only as were considered necessary for the proper enjoyment of life, liberty and property), the government did carry on internal improvements such as the constructing of canals, harbors and wagon roads. But corruption, extravagance and incompetence in carrying on these works of internal improvement created in the public mind a distrust of the wisdom of entrusting such work to either the general government or the state government, and so we find in the constitutions of some of the states an absolute prohibition of internal improvements by the state. The constitution of the state of Minnesota contains such a prohibition, and in a case which went to the supreme court, it was decided that the term "internal improvements" in our constitution meant the improvements of wagon roads. You will see then that public opinion upon this subject has radically changed in United States from the idea that the building of public wagon roads was a legitimate governmental function because roads were necessary to the enjoyment of life, liberty and property, to the opposite extreme of prohibiting the state from having anything to do with the building of wagon roads.

STATE AID FOR SCHOOLS.

But while the state is prohibited from building wagon roads it has not been prohibited from applying the principle of state aid to the conduct of public schools. And in the state of Minnesota we have a large state school fund, at present about $10,000,000, the income from which is distributed together with an annual mill tax to all the school districts throughout the state which shall conduct a school of a certain character during each year. This system you are all familiar with. The state does not undertake to carry on any of these district schools but aids in sustaining them by paying part of the expense of running the schools. Now, it is upon the same principle and by a system very similar to the state aid for country schools that it is proposed that the state shall aid in the building of wagon roads.

STATE AID IN NEW JERSEY.

We have not only the early history of United States and the experience in the conduct of our district schools as precedents for state aid, but in the state of New Jersey they have adopted this principle in the construction of country wagon roads, and I am informed that farms lying along the roads improved through state aid have increased in value during the past few years as much as 100 per cent. One farm which went begging for a purchaser at $40 an acre before the roads were improved, has since been sold for $125 an acre, and this increase in value of farm property in New Jersey along these improved wagon roads has taken place during the recent years of panic when every other kind of property nearly has decreased in value. The farmers haul four or five tons on these roads at a load, when a ton or less was formerly a heavy load, and so popular and successful has state aid been in New Jersey that the farmers

are now clamoring for more than the state can supply, and the system adopted there is being copied more or less in various states of the union.

STATE AID IN MINNESOTA.

At the last meeting of our legislature Mr. Douglas, of Clay county, introduced a bill for the amendment of our constitution, which will permit the state to aid in the building of wagon roads, and the adoption of that amendment will be submitted to you at the next state election, and I am glad of this opportunity to explain its purpose in order that you may vote intelligently upon it next fall. This amendment first provides for the establishment of a fund to be known as the state road and bridge fund, by using the income derived from investments in the internal improvement land fund, also all funds accruing to any state road and bridge fund, however provided, and also by a tax levy upon all the taxable property of the state of not to exceed in any one year one-twentieth of one mill.

Thus you see but a small portion of the fund will come from the country districts—less than one-quarter of one per cent of the general tax, and none of the internal improvement fund. The amendment also authorizes the appointment by the governor of a state board, to be known as the state highway commission, consisting of three members, who shall perform the duties of their office without salary or any compensation other than personal expenses. It also provides that no county shall receive in any one year more than three per cent nor less than one-half of one per cent of the total fund expended during the year, and in no case shall more than one-third of the cost of construction of any road be paid by the state from the state fund. This amendment being a constitutional provision of course does not go into details, but the purpose of it is to institute in Minnesota a system of state aid similar to that which has given such excellent satisfaction in New Jersey.

STATE AID VERSUS STATE CONSTRUCTION.

And here I desire to call your attention to one thing, and that is that under this amendment to the constitution it is not proposed that the state shall ever build a single highway anywhere.

In view of the dangers of extravagance and corruption so frequently attending the carrying on of public improvements by state and national authorities, and which were probably the principal causes of revolution against the making of internal improvements by the state; and in recognition of the policy of our government to relegate to the local authorities, as far as possible, the control and management of affairs of local interest; it seems to many that the plan of state aid, as distinguished from construction by the state, is a safer course than to return to the original practice of construction of highways by state officials. State aid as distinguished from construction by the state is the middle ground between the old method authorizing the state to carry on the work and the more recent practice of absolutely prohibiting the state from being a party thereto. I am disposed to say that the state should actually

build no wagon roads whatever, but that it should aid in their construction by contributing to the completed road a certain proportion of the cost, somewhat as it aids in the support of country schools, the balance to be paid by the locality where the road is located. This intermediate ground, which seems to be the golden mean between two extremes, is one which has been adopted in New Jersey and is proposed for Minnesota.

By this system of state aid, the roads, to the cost of which the state contributes, must be built according to plans provided by the state and must be approved in a complete condition before the state puts any money into them. The roads are built under the immediate supervision of the local authorities and chiefly at their expense, the state usually paying about one-third. By this means the extravagance frequently attending state construction is avoided by local supervision at local expense, while the inefficient and wasteful supervision usually accompanying the building of roads by purely local authorities is avoided by the general supervision of the state.

RECAPITULATION.

First,—Requiring the rural population to improve the roads at their sole expense is unjust and impracticable and a violation of the principle that taxation should be equal and uniform.

Second,—State aid is not a new and untried theory, but has been successfully and satisfactorily tried, not only in our public schools, but was recognized in the early history of our government and has recently been successfully tested in an improved form in actual road building, especially in New Jersey.

Third,—State aid does not result in extravagance and corruption, so frequently associated with internal improvements by the state, because the work is done by local authorities mostly at local expense, thus creating a local interest which checks incompetence and corruption.

Fourth,—State aid secures a better class of work than is usually done by purely local effort, because plans for the work are furnished by the state and the finished work must be approved by the state authorities before the state money is invested, thus furnishing a check upon any tendency to local neglect or incompetence.

Fifth,—The best test of any method of road building is the question, will it provide good roads economically and justly and equitably divide the expense among the parties interested? Tested by this question there has never been any plan proposed which was more just and more practicable than that of state aid.

LATE CABBAGE AFTER STRAWBERRIES.—After the second year's picking, the commercial strawberry patch is plowed—sometimes after the first crop—and set to late cabbage, provided cabbage had not previously been grown on the piece for some years. Such land is usually free from cabbage maggot, the soil is in good heart, the strawberry vines and weeds plowed under supply humus that retains moisture, and the cabbage usually do well.

THE SPRUCES AND THEIR USES AND VALUE.

WM. S. DEDON, TAYLOR'S FALLS.

To persons not accustomed to handling or seeing the different varieties of evergreens, their distinguishing features seem to them an endless tangle that will never be straightened out.

The true coniferæ, or cone bearing trees, may be divided into three natural classes: the pines, firs and larches. The fir, as distinguished from the others, has its needle-like leaves arranged singly on the branches and not in clusters. Originally the term fir was applied to the Scotch pine by our Scandinavian forefathers, but since it has come to be more commonly applied to the trees belonging to the genera Abies and Picea. At the present time most botanists apply the word fir to the genus Abies and spruce to that of Picea, but there are still others who use the terms just opposite. It is not our object to argue the botany question here; we will not attempt to form a division, but use the more inclusive term of fir, as a boundary for the domains of this article.

We are naturally more interested in those species which are included in the flora of our own state, and therefore we will consider them first, although they may not be of prime importance to the horticulturist.

Throughout the northern and north-eastern portion of the state, in a section where the pine is rapidly disappearing (if it has not already ceased to exist), we still find another evergreen, which seems to be at home in a soil that is of a peaty nature and too damp for the former to grow upon. This is the black spruce, Picea nigra. In moist locations they grow very closely and quite luxuriantly, making tall, slender trees that are almost barren of branches. Generally they are crowned with an immense number of small, weather-beaten cones. In this species they adhere to the trees for several years and give to it that dismal and dingy appearance which makes it so objectionable as an ornamental evergreen.

Interspread among the black spruce and on the higher ground back, we see a variety much similar to it when small, but easily showing its superiority as age advances and enlivens the color of its foliage. The white spruce, Picea alba, is one of the most handsome and valuable timber and ornamental trees we have. It is found more plentifully farther north in the Canadian provinces, and stands more cold than any of the other spruces. Seedlings of this species are not very abundant, and, hence, the black spruce is often substituted intentionally.

A tree much resembling the white spruce in appearance from a distance, is the balsam, Abies balsamea, which makes a longer, robust tree in rich, moist situations. It is quite abundant but not very desirable for ornamental use, owing to the fact that it is short lived and does not withstand drought well.

Farther to the east and northeast of us, we find still another species, which often attains gigantic proportions—but only an occasional hemlock spruce is seen among our flora. It is a valuable timber tree, but the tree planters of our state have apparently erased

it from their lists, as it seems to succeed only in sheltered locations. In eastern Canada as well as in Wisconsin, Michigan and Maine, this tree is largely cut for its bark as well as for lumber. But the tree makes poor lumber, as it is very cross-grained. The bark is used for tanning purposes, and as it commands a fair price it is a large and paying industry.

Among trees of this order not natives of the "North Star State," we first mention the Norway spruce, Picea excelsa, which is probably as universally known as any evergreen we grow. It naturally grows a little farther south than the white spruce, as it cannot stand as much cold, but it seems to withstand severe droughts much better. The Norway spruce is a fine, thrifty grower, and as it matures its fine pyramidal form, together with its drooping branches of olive-green foliage, give to it a majestic appearance surpassed by few of its class, making it one of the most picturesque trees we have for park or ornamental plantings.

Other than the Norway and native spruce, we have several of the Rocky Mountain species which well deserve a moments notice. The peculiarity with them seems to lie in the beautiful light blue color of some specimens. All of the species seem to vary greatly in color, and generally not more than one-third of the seedlings have the desired tint.

The Colorado blue spruce, Picea pungens, is by far the most beautiful of our evergreens. As yet, the planting of it in this state is in its infancy, on account of the exorbitant price charged for select trees; but from the hold it has taken and the way it promises at present, it is destined to become a sentinel among our ornamentals.

Another tree from the same flora, and a rival of the blue spruce in color, is the Douglas spruce, Pseudotsuga taxifolia. It resembles the hemlock very closely both in growth and uses, but is far hardier.

Abies concolor and Engleman's spruce, Picea Englemanii, have also been tried to some extent in this state, and so far have proven themselves hardy and worthy of notice, but are overshadowed by the two others spoken of.

There are numerous other uses to which the spruce is put besides its value as an ornamental or windbreak tree, and industries connected with the growth and destruction of which we would never have dreamt.

As the lumbermen skimmed over the woods a few years ago for the best timber, they little thought that others would follow in their trail and utilize the leavings; but now timber is becoming so scarce that when any is cut they recognize the value of all. Along with the pine, the spruce now suffers from the woodman's ax wherever it can be found of any size. Spruce is not as resinous as pine and hence is not as adaptable for outside uses, except for masts, etc., where lightness is a desired factor as well as strength. Enormous quantities are annually cut for lumber, and in some sections fully as much as of pine. Of later years a new industry has increased wonderfully, which utilizes an immense amount of this

timber for pulp, from which is manufactured pails, barrels, water pipes, furniture and numerous other articles as well as paper. At the present time there are about 250 pulp mills in operation in the United States, annually using over 500,000,000 feet of spruce, besides the poplar, pine and other woods employed. The tanning business, for which so much of our hemlock is cut, has already been mentioned.

The Norway spruce is used considerably in its native land for the production of resin, and although it does not contain near as large an amount as do the pines, yet the value of this product amounts to no small sum.

As the Yule-tide approaches, we cannot but call to mind another industry, which, at this season of the year assumes gigantic proportions, and is a practice which annually diminishes the number of our fire. That is the cutting of spruce and balsam by the tens of thousands, which are shipped from here all over the northwest for the celebration of a meaningless custom. We do not say "meaningless" to discourage its patrons, for where do we see a happier sight than beneath the boughs of the Christmas tree? But, if trees are to be used, why is this not a good opening for the growing of such trees for market? The supplies are being speedily exhausted among all kinds of evergreens and certainly the assurance is not towards a diminished price for the product of the gardener.

SHRUBS FOR FARM HOME DECORATION.

ROY UNDERWOOD, LAKE CITY.

All things taken into consideration, the hardy shrub is, without doubt, the principal factor in lawn decoration of any kind; trees form the ground-work, and shrubs fill in to work out the natural effects, while the flower beds are of a more artificial nature, which the hand of genius and art may weave with beautiful details. Contrasted with the annual garden flowers, is its stability. In the spring when the work of starting the flower-garden must be done, there is always such a rush of general farm work that this feature is apt to be in the way if attempted on a large scale. Of course, we could not do without the pansy bed, and the asters and the verbenas from which to pick a few blossoms for the table or an occasional one for the buttonhole, but when we begin the decoration of the farm-home grounds we seek for that which will be the most productive of beauty with the least time and attention.

It is my purpose within the limits of this paper, to point out just a few of the many desirable shrubs available to the Minnesota farmer, and after applying to them the tests of hardiness and beauty, he may give the reins to his decorative genius, for he is sovereign in that he has unlimited room for it. As a general thing, farmhouses are approached from the highway by a private road, leading past the house to the barns. Here is splendid opportunity for decorative improvement, for, as we know, first glimpses, like first tastes, always make the deepest impressions. So let us grade the road to a center for drainage, and on either side, about three feet

from the ditch and twelve inches apart, set two year old plants of the purple barberry. After these have reached a height of two or three feet, they may be sheared into a hedge, and if this is continued every June we will soon have a beautiful border to our road that will elicit a feeling of pleasure every time we pass. Or, if our roadway is not limited, a pleasant variation would be to plant the barberry on the side toward the house and on the further side put in some of our common staghorn sumach. This is a rapid spreader from the root and if confined to a strip, say three feet wide, will, with its brilliant leaves and showy berries, make a pretty outside border. This variety of sumach is valuable, too, for bare gravel spots and steep slopes where sod will not easily cling. It has a rugged, penetrating root, which with its spreading growth forms a harbor for the sod.

The first place we usually strike on approaching the farmhouse is its side door, which most frequently takes the place of the front door in town and should be made as inviting as possible. A clump of golden elder should here find place. Attaining to a height of six to eight feet, it will with a little judicious training grow into a well shaped head of yellow richness, vieing with Alaska's fields of gold.

Near the horseblock, somewhere, with an evergreen background, if possible, put in specimens of spiraea Van Houtü, which, in latter June, blossoms into a symmetrical mass of white fluff. After you have seen this bloom, you will want to set the whole place out to spiraea Van H. But don't overdo it; six or a dozen more, at the most, will be enough.

Now, stepping around into the front yard, we find we have a large margin of space to fill in order to nicely define the grass plot in the center. Here we would wish to find some of the other varieties of spiraea, in order that we may have successive blooms of this valuable shrub, of which there are at least fifty distinct varieties. The varieties prunifolia, billardi, sorbifolia, and rotundifolia will give this effect, the last named being especially valuable, with round glossy leaf and flowers in large heads. Here let us also have at least two specimens of Philadelphus, or mock orange, which we learn to prize not alone for its beautiful early summer flowers, but as well for its rich perfume.

Two well known members of the viburnum family are the snowball and the high bush cranberry, the latter particularly desirable for its clusters of bright scarlet berries, which hang on way into winter.

Euonymous, variously known as spindle tree and burning bush, is a symmetrical and upright shrub, valuable for its fine foliage and peculiarly shaped red berries in midsummer and fall.

Prunus trilloba is one of the best of the flowering plum class, with beautiful double pink flowers in June.

I cannot refrain from mentioning one class of roses which may very properly enter the ranks of hardy shrubs, the Rugosa roses, which are highly ornamental on account of their good growing habit and beautiful glossy foliage. Rugosa rubra is a vigorous Japan

variety, with flowers of a bright rosy crimson, succeeded by remarkably large haws of a rich cherry red. Rugosa alba has white flowers but is not as strong a grower.

We cannot pass without a word on three or four of our hardy *climbing* shrubs. The American ivy, or Virginia creeper, has beautiful digitate leaves, that become rich crimson in autumn. It is a rapid grower and throws out tendrils and roots at the joints, by which it fastens itself to anything it touches. It affords shade quickly and is one of the finest vines for covering stone walls, verandas or trunks of trees.

Clematis Virginiana, the American white clematis, is a rapid climbing plant, growing to the height of twenty feet, producing animmense profusion of white flowers in August.

Aristolochia sipho, Dutchman's pipe, is a native species of rapid growth, with magnificent light green leaves ten to twelve inches in diameter and curious pipe-shaped, yellowish-brown flowers.

Celastrus scandens is a native plant of twining habit, with fine large leaves and yellow flowers, and is particularly adapted for running up into dead or dying trees, as it grows ten to twelve feet in a season.

If you will allow me to use the term "shrubby evergreens"—meaning, thereby, the lower growing kinds—I would by all means advise a generous plantation of these, the most beautiful of all shrubs for the north. Unharmed by winter's rigors, they are ever with us, cheering us with their green when all else is leafless and clothed in white. So let us plant graceful groups of these in which will figure specimens of the dwarf mountain pine, juniper savin and the Siberian and pyramidal arbor vitae, all of them beautiful and hardy.

Let us not overlook the back yard in our scheme, for here, withal, our steps most often lead us. This is an excellent place for experiment with decorative shrubs and for testing our hobbies. On the limits of the yard I would plant a hedge of caragana, the Siberian pea tree. This grows to a height of eight and ten feet and is a beautiful shrubby tree, with small pinnate leaves of the same character as those of the acacias but much smaller and bearing small, delicate yellow flowers in early June. With the rare green of its foliage, this is not only a beautiful shrub in the hedge but makes a first-class individual ornament as well.

And, finally, let us retire to the shady side of the house and give ourselves over to a little sentiment. Here where June's midday sun shines warm and radiant, where the buzz and hum of the merry bumble-bee lures us to pause and give ear to nature's voices; here where evening zephyrs waft sweet fragrance through open window bars, let us not forget those good old time friends of ours, the honeysuckle and the lilac.

DISCUSSION OF ORNAMENTAL LIST.

(Continued from Page 12, January number.)

Mr. Bryant (Illinois). There is a difference in shape between the green ash seed and the white ash. The wing is rather longer in the green ash. The varieties of ash run together a good deal. The root system of your ash is the same as that which would correspond with our tree that we call the blue ash. This is a strong grower, and, if anything, makes a larger tree than the green ash. The twigs have the vigor of one-year-old shoots. With us the black ash is a poor grower; I do not know how it would be here. The blue ash is a strong, vigorous grower and makes a handsome tree. I want to say a word about the hop tree. There is another variety, and if you were ordering trees in our part of the country, you would not generally get this ironwood, or hopberry, or horn hop tree, but the tinnia trifolium; it has quite a large bladder-shaped bud, and it is said they were used in the early days in place of hops.

Mr. Harris: Is not that what is known as the bladderwort?

Mr. Bryant (Illinois): Yes, it is the tinnia trifolium. It is sometimes called the hopwood or hornberry; it is nearly the same thing; it is sometimes called the hopwood with us.

Mr. Gibbs: The black ash, is, of course, a native of low and swampy places, and it would not be expected to do well at any other place, but still they do well in gravelly subsoil. About the hopberry; I have a good many on my place, and when I first went there I was not acquainted with the hopberry, and at first sight I thought I had a lot of sugar maples there. The trunks looked like sugar maples, but when I looked up in the limbs I saw it was something else from what I first thought it was. I do not think they are quite as hardy as oaks. In those drouthy years I have had more of them die out than anything else I had, although many of the hardy trees like oaks and elms have given up, and I can see no reason for it except they have succumbed to the effect of the dry years. That is something you hardly ever see in the ash and elm.

Mr. Jewett: I want to add my experience in regard to the hackberry. I think the hackberry has not had sufficient attention paid to it. I have a place in Rice county that has been especially exposed to the heat of the sun, and I noticed my hackberry were in full leaf when the other trees had dropped their leaves. The piece of ground is next to a lake and has quite a fringe of timber around the lake, and the hackberry has killed out less in the last eight to twelve years than anything else I have there. The timber of the hackberry is an excellent timber and makes a good substitute for ash in the manufacture of anything requiring a straight grain. It is not as resistant as ash. The rock elm is one of the finest timbers we have for all kinds of wagon work. It makes good felloes and is as tough as our eastern hemlock.

Prof. Green: Talking about the ash this morning reminds me of the fact that we have great difficulty to make a clear distinction between the white ash and the green ash. I have tried to make out this difference, and I have not been able to find out what was the

green ash and what was represented to be the white ash. If anybody can tell me the difference I would be very glad. I believe they are the green ash up this way. I do not know the difference, and I do not believe it is easy to tell. In reference to the allusion to the hardiness of the hackberry, perhaps it may be interesting to know that it grows abundantly in the Red River Valley in this state, and I have quite a lot of seed gathered at Warren in this state, and this fall we gathered about a peck and a half of seed on the streets in Minneapolis; three men gathered that much in a couple of hours. There are some large trees, very nice trees, here. In regard to the green ash, there is no question about that. We have the green ash at the State Farm, on good clay soil, but somewhat dry; it has made a good growth, but not a very rapid growth. In regard to the rock elm, we can say just the same thing of the rock elm; it holds its own well, but is of rather slow growth. It makes very fine timber, and is very valuable.

Mr. Gibbs: We are all at sea as to what constitutes hardiness, unless we draw the line between the hardiness that endures extreme cold and the hardiness that endures extreme drouth. Prof. Green is referring to winter hardiness, and I refer to its ability to withstand drouth. One is just as important as the other in this northwestern country. We have many valuable trees that have this winter hardiness, but as to their summer hardiness that is another thing.

Judge Moyer: In regard to the green ash in South Dakota: When Prof. Williams was botanist at Brookings he published a bulletin from the South Dakota Station, and he found that the green ash was growing all over the state, and that the white ash was found in the Missouri River bottoms. Still there were found a few white ash in the southeastern part of the state.

Prof. Thornber (S. Dakota.): Prof. Saunders has found the green and white in the northeastern part of the state, but only a few specimens of the white ash.

COLD STORAGE OF GRAPES.—Commercial growers and packers are now experimenting with large dry cold storage houses for certain varieties, believing it practicable to carry grapes until February, when fruits are comparatively scarce and prices high. Among the favorite winter keeping varieties are the Catawbas and the Vergennes. Grapes intended for long keeping are taken from the vines before dead ripe and placed in shallow boxes in the packing house for a few days, until the stems have wilted and much of the moisture has disappeared. Baskets for their reception are lined with paraffine paper, and the fruit is carefully selected and packed. The baskets are then placed in the cold dry storage house, and the fruit is said to keep remarkably well, many weeks later than when stored in the usual manner. Upon being taken from these cold storage houses the fruit is liable to deteriorate rapidly, but through the use of modern refrigerator cars and cold storage systems of big markets, there is no reason why winter grapes may not be advantageously handled.—*O. J. Farmer.*

SAUK RAPIDS TRIAL STATION.

MRS. JENNIE STAGER, SUPT.

We had no frost of any account last spring and should have had a wonderful season had it not been for the worms. They came and came, and still they come. We cleaned the trees and bushes in the spring of all egg cells, and thought we should escape the pest, but they began to come from the northwest, in companies, battalions and armies. They covered the ground, the trees, the houses and even the horses. Of course, we fought them and, at least, as we thought, saved our plum and apple trees. But, alas, we reckoned without our host! They were getting less, they were really going, were gone, with the exception of a few weak travelers, and we were joyful, when, lo and behold, we were awakened one morning with a great outcry: the worms! the worms are here again! And sure enough, another army much larger than the first was marching down upon us. Trees, bushes and everything else were black with them, and still they came.

Human endurance could stand no more. We retreated to the shelter of the house and wire screens and raised the white flag. The upshot was they cleared off everything green and at last departed in disgust because there were no more leaves to conquer. But still they left us a reminder; they left their dead in piles on evergreens and bushes, telling us they may pass here again.

Our fruit trees that were weakened by the open winter look almost ruined, but, strange to say, with most of the leaves eaten from strawberries, currants and gooseberries we had quite a good crop. The raspberry did poorly, and there were no wild ones. Grapes, both tame and wild, are hanging full and to make up for the loss of other fruits melons are in abundance.

August, 1898.

FALL PRUNING AND WINTER PROTECTION OF THE RED RASPBERRY.

H. L. MELGAARD, ARGYLE.

After the fruit has been gathered the old canes should be removed.

In our severe climate winter protection is an absolute necessity. Without winter protection even such hardy varieties as the Turner and Philadelphia will winter-kill, except in an occasional winter when there is a large amount of snow on the ground.

Earth is the best covering. The canes should be covered late in the fall before the ground is frozen hard. In laying them down commence at one end of the row, remove the soil from the side to which they are to be bent; bend the bush in the root as much as possible until almost flat on the ground, and hold it there while it is being covered. Each succeeding bush should be bent down and covered in the same manner, making a continuous covering. Only enough earth to hold down and cover the canes is necessary.

SHELTER BELTS IN THE RED RIVER VALLEY.

D. R. McGINNIS, ST. PAUL.

The yearly rainfall of the Red River is amply sufficient to cause it to be a densely timbered country, if the surface was more broken and the soil less fertile. As it is, if the rainfall had been as much as five inches per annum more than it is, it would have been a vast cedar and tamarac forest instead of an open prairie, as at present. Even the slight protection afforded by the streams is enough to make vigorous elm, oak and ash timber belts along the streams, which are a welcome break to the monotony of the prairies.

The principal objection to a residence in the valley is not the cold, for it is healthful, but the strong winds which sweep during winter across the level, unprotected plain.

Fortunately, if properly done, shelter belts can easily be raised in the valley. There are, however, some difficulties to surmount, The ground being low, young trees are apt to be severely injured by too much water from melting snow and by late spring frosts in May. September and October are sometimes very dry months, and young trees suffer from drouth and more still from the danger of being destroyed by prairie fires if not carefully protected.

The best varieties to plant are the elm, cottonwood, ash, aspen and box elder, and possibly tamarac. All are natural to the country. Birch also will succeed well. It grows abundantly just east of the valley. It should be planted in the center of groves.

We see many stunted shelter belts there, but this is caused by neglect. Success depends on proper preparation of the soil and careful cultivation while the trees are small. Without this is given, failure will result, prairie grass will close around the struggling trees, strangling their roots and making fuel for prairie fires to ruin in minutes the growth of years. The ground should be under thorough cultivation, the grass roots should have been entirely rotted out.

The trees should be thickly planted in order to furnish mutual support, to keep the drying sun rays and wind from stealing the moisture from the earth and to make the trees grow tall and straight instead of a mere bushy scrub. That is nature's method; man pursues another way, as a rule, and fails. The trees should be close enough to completely shade the ground after the second or third year. Cultivate as long as you can get a plough between the rows. Do not permit grass or weeds to choke them. During snowy winters, the snow drifts off the bare fields to the shelter belts and does great damage from breaking them down. An advance belt of brush and cottonwoods should be planted, especially on the north, to stop the snow before it forms high drifts in the main belt. Brush is the natural protection and advance guard of the large forest trees. In conclusion, keep sun and drying wind from the roots by thick planting, frequently cultivate, let no grass and weeds grow while they are young (when they are old enough to thoroughly shade the ground they will keep them out themselves), plant advance shelter belts of cottonwoods, rose bushes and hazel brush to prevent breaking down from snowdrifts, and you will be surprised at the results; but neglect any one and reap failure.

THE EVER-BEARING RASPBERRY.

E. A. BROMLEY, MINNEAPOLIS.

The everbearing raspberry is a subject I approach with fear and trembling, although it has no thorns. Unaccustomed as I am to public speaking and red raspberries, you will pardon me if my remarks run to sprouts and suckers instead of ripe, rich, scarlet fruit. The ever-bearing red raspberry, gentlemen, is a fruit with which I am not as familiar as I would wish to be—in the form of jam. When I was a lad I knew more about red raspberries through the medium of jam than I do now. I noticed, even at an early age, that raspberry jam, like sin, left its mark, and that until the raspberry flavor had disappeared from my breath and the brilliant color from my mouth, it was as well not to ask my mother how the Connecticut farmers raised the berries.

As this particular berry is almost unknown in this region, you have most wisely and appropriately chosen one who knows least about it to tell you of its everbearingness, its redness and its raspberritude. I have never raised any raspberries—the owner was always looking—but I would like to; I would even risk an attack of appendicitis to form a more intimate acquaintance with the berries which, alas, are simply under consideration and not under our waistcoats.

But speaking seriously, gentlemen, I hope that when I am through with this paper you will be as much interested in the everbearing red raspberry as I was when I first made its acquaintance.

In the month of October last I visited Wisconsin, and in the town of Cassville I saw a large patch of raspberries that were bearing at that time. About three blocks from there I saw another patch similar to the first, and I afterwards learned they were owned by the same gentleman. As I say, I know very little about raspberries, and I wish the gentleman were here so he could speak to you himself of what I saw that day. I think it was the 12th or 15th of October, and he picked two crates of raspberries. I have a letter here from him which I will read.

"The Excelsior Everbearing raspberry is, as far as I am able to find out, a native of Wisconsin.

"In 1878 Dr. F. M. Cronin, now of Lancaster, Wis., was living opposite to me. I was trying hard to have as good a garden around my home as I could get with my own labor and limited means. Dr. Cronin told me one day that on his aunt's, Mrs. Whitesides, farm they used to have a raspberry, and he knew that if I had it I would prize it highly. I had several kinds of raspberries, and they were a tangled mass in the garden, as fully half of my time I was away from home surveying, and when at home garden vegetables in season first, and my roses and other flowers and vines, attracted my attention.

"Well, one evening late in the fall, my friend Cronin brought me two raspberry plants—this must have been in '79. I planted them, expecting nothing of them but thorns, of course, and I neglected them. But in early July following I discovered some splendid berries on them and presented them to my better half, who pronounced

them superb. At that time there were on one two, and on the other three thrifty young shoots, "canes from the root," about two and a half feet in height. They must be saved, and I stuck a stake by them and tied them to the stake. I did not look at them again till, accidentally, on election day, in 1880, I found that where the vines stood, close to the fence, the ground was rich, and in front of them I had planted some small prune trees and about 1,000 hedge hawthorns, imported from Holstein, Germany. With these hawthorns, mixed in with the roots, a large number of roots of what they call duenengrass had found ingress in my garden. The grass was tall, and those raspberries, the young canes, had bent over among the grass, and there I found on the tips of the twigs ripe and green berries, buds and blossoms. I have since then taken good care of them and tried to propagate them.

"The yield I have been asked for at different times, and, in 1887, I undertook to keep account of a small patch which had on the west a board fence, east a grape arbor, north a woodshed and south my poultry yard and stable. The piece so circumscribed was 79x27 feet, or 2,133 square feet, or 7 $\frac{133}{160}$ square rods. A strict account of all berries picked off of that patch showed 378 quarts. The rows were three feet ten inches, or say four feet, apart and very unhandy to pick, and though the above would give 8,000 quarts to the acre you cannot count on that. I think by keeping them clean 5,000 quarts to the acre is an average yield. I have them now six feet apart as to the rows and three feet in rows. They need no covering in winter.

"I have a patch of upward of two acres on sandy ground, and they do well. I had some on my farm, three miles below town, on sand, and they did well. The garden by my house is very rich, black soil; there the vines grow larger and the trellis must be higher. Our farmers raise them on clay subsoil ground.

"The Excelsior Everbearing raspberry does not spread. The roots never grow to the surface. Neither do the tips take root, even when covered not one out of 100 will sprout. New plants are obtained by digging up the plant and dividing the root, as is done with gooseberries and currants. The plants begin to bear the latter part of June and continue to bear till frost comes, thus giving more than three times as large a crop as any other variety. Why they bear so long? The new shoots which come from the roots in spring bear berries in the fall of the same year. The old wood of the previous year's growth bears a fair crop during July and August, and the new wood of the present year's growth begins to bear in August and bears till frost kills vegetation. Dry weather generally means a failure of the raspberry crop; not so with the Excelsior. Even in a severe drouth its crop is not affected. It bears continuously from June till late in the fall. It is enabled to do this because it has long roots which grow down deep into the ground. The plants are hardy, requiring no covering or protection of any kind, even in the severest winter. The berry is large and of a dark, red color, and has a delicious flavor.

"While I have not a good home market for the early berries, my main aim is plants, and for that purpose I cut in the fall or during

the winter the wood within two or three inches of the ground which gives the roots a chance to furnish more sustenance to the sprouts from the roots for fall bearing."

Mr. C. L. Smith: What is the name of the man who owns the raspberries?

Mr. Bromley: His name is J. H. C. Sneclode, Cassville, Wis.

The President: How large were the berries?

Mr. Bromley: Just as large as any I ever saw.

Mrs. Kennedy: What color were they?

Mr. Bromley: They were a dark red.

Mrs. Kennedy: Is it a firm berry?

Mr. Bromley: Yes, it was in perfect condition.

Mr. Busse: I would like to inquire if there is any one here who knows anything about the berry?

Mr. Bromley: He told me some gentleman at Owatonna was growing some of the fruit.

Mr. Jewett: I have fifty bushes growing on my farm in Rice county. The last week in September we left our summer home in Rice county, and they were in blossom and fruit, and I can say everything about it that Mr. Bromley has said except as to the size. The vines were in full leaf. I was interested in learning the method of propagation; Mr. Bromley says we must propagate by root cutting.

Mr. Bromley: Mr. Sneclode told me they had tried other methods, but the berry had invariably gone back to its wild state. He said he had one vine that was apparently a white berry, and he gave explicit directions to his gardener to propagate that berry, but the gardener did not do so, but appropriated it to his own use.

Mr. Jewett: I will say that a man at Waterville by the name of Borner has a stock of those plants. I think he can give you some information. I learned from a son of mine who lives there that he had berries which he took to market the latter part of October. They are a very fine fruit, rich in flavor.

The President: In growing this raspberry, I think, without doubt, it makes a difference in regard to soil and location. I think that fact has more to do with the case than anything else. At our place we have never had any success with any ever-bearing plant. We never had any success with any ever-bearing fruit. We had this ever-bearing raspberry for a number of years and discarded it entirely. We tried faithfully to get something out of it, but it was an entire failure. The berries were small and inferior, but the plants were thrifty.

It was like the ever-bearing strawberry. We had that for a while; it originated across the lake. It was sold to Salzer, but it was not a desirable thing to have, and it was impossible to sell it to anyone. We just kept a little patch to look at, but it was perfectly worthless as an investment in fruit. It may have done well with some one else in a different location; I cannot say anything about that. Doubtless where Mr. Jewett lives and where this gentleman saw it it may do well, and it is possibly a mistake that we do not keep the Sneclode raspberry. We paid Mr. Sneclode $15 per 100 for them.

Mr. Jewett: I do not want it understood that I endorse the raspberry. I see the mistake in our cultivation in that we had no trellis. It was a very thrifty plant. We cut down the plants this fall, and we expect to get a nice crop next fall.

The President: The Marlborough does well at Lake Minnetonka, but it is a failure in other places. So it may be with this ever-bearing raspberry. It may be a failure with us, while at other points in the state of Wisconsin it may be a perfect success.

CULTIVATION AND PROTECTION OF VINEYARD.

A. A. BOST, EXCELSIOR.

It would be hard for me to give a five-minute talk on cultivation and winter protection of the vineyard without infringing on the subject of pruning, and that will be taken up by others.

With vines trained on third wire from the ground instead of on the lower one, as they are usually trained, cultivation can almost entirely be done with horse cultivators, saving much hard labor. Grape vines, like every other fruit plant, need frequent cultivation, and will stand cultivation later in the season than many other things, although I do not want my vines cultivated after Aug. 15th, at the latest. I prefer cutting out weeds with a hoe, if necessary, rather than to stir the ground later than that.

In our heavy soil around Lake Minnetonka we think cultivating should be done about once a week through the growing season. Then after laying vines down for winter I plow the whole ground over, say three or four inches deep, plowing toward the vines. This does most of the covering and helps a great deal about the next spring's cultivation. The furrow left in the center of the row furnishes a good drain for surplus water from melting snow in the spring. This is all the winter protection we think we can afford to give our grape vines at the present low price of grapes, but vines should be well mulched the first winter or two after setting in vineyard; and where the vineyard is in a badly exposed place, where snow is likely to blow off, it should be mulched to insure against winter-killing.

IS A FARM HEDGE FENCE PRACTICAL OR DESIRABLE IN MINNESOTA?

J. P. ANDREWS, FARIBAULT.

It would be presumptuous on my part to attempt to give a definite answer to this question, circumstances are so variable. What may be advisable for one person in a certain location may not be so for another differently situated. The farmer of moderate means, especially if he has had considerable experience in Minnesota, would, if he takes hold of it at all, be likely to plant only a few rods at first to test it, which course would be quite practical for him; while, on the other hand, the farmer with plenty of cash and little experience may think it advisable for him to enclose his whole farm with a hedge, and should he choose osage orange or honey locust, the most practical part of this transaction would be getting his money into circulation and increasing his stock of experience. Therefore, we will only call attention to a few points that should be considered before a person decides to fence his farm with a hedge.

First, as to the durability and hardiness: It must be perfectly hardy, or it will, of course, be worthless. It will not be likely to have much cultivation after the first two or three years, consequently drouth will be as much or more severe on it than will be our hard winters. We think there has been no hedge plant sufficiently well tested in different situations in this state, to be worthy of planting more extensively than a few rods for trial. The fact that a few stray plants may have survived for a few years proves nothing. Peach trees will do that, they may have been sheltered by other trees or otherwise favorably situated. We should have these plants on trial, in trying locations, for when we build a fence it is liable to run over very unfavorable spots, and if on these severe spots the plants kill the hedge is surely a failure.

The buckthorn is probably the most promising hedge plant we have, and we believe the wild thorn-apple to be worthy of trial.

The osage orange was planted two or three years ago quite extensively within thirty or forty miles of Minneapolis. The agent who sold it pronounced it a great success—to get the farmers cash. Probably his customers are now ready to replace with something else.

We would not be understood to discourage the planting of a hedge if hardy plants can be obtained—wherever we would like to combine the ornamental with the useful and are willing to go to the extra expense and care to make it a success. We should remember, however, that a hedge will harbor weeds to some extent, will cause snowdrifts, that in some places are objectionable, and will need trimming annually or if neglected will show the neglect quite as soon as our old slack wire fences; but if kept trimmed and well cared for they are certainly much more ornamental than are the wire fences in their best condition.

The best way to obtain a hedge is to get the seed from a seedstore, and grow them one two years in a garden before planting into the hedge. In this way the cost of the plants will scarcely be noticed.

There is being introduced into this state a combination honey locust hedge and wire fence, which is claimed by the company introducing it to be a great success, and which has been very heartily recommended by high *official* authority of the state, but most earnestly condemned by our highest *horticultural* authority, on account of the tenderness of the honey locust and the general plan of the whole scheme. There is no doubt this fence will be a great success for the company, that plants it out for $1.00 per rod, or $640.00 to enclose a quarter section. As there are some farmers who are trying it, we suppose from their standpoint it is a practical hedge fence for them.

We venture to say the farmers who purchase this fence probably have some very valuable property to enclose, like a wine grape vineyard, a Rocky Mountain cherry orchard, or one of those valuable $85.00 model orchards. The premises wouldn't be secure, nor the picture complete, without enclosing it with a honey locust hedge and wire fence, that I suppose keeps everything out, for if jack frost gets into one of those model orchards he is sure death to the trees. In conclusion, if we must have a hedge fence we think this combination fence is a good one if properly mixed. The more wire and less honey locust, the better will be the fence.

EVERGREEN HEDGES.

A DISCUSSION.

The President: Something has been said in regard to watering and transplanting evergreens. I would like to say a few words in regard to that matter, if I am permitted, that may be of some benefit to those who have not had similar experience to what I have had. In the first place, I think we have made a mistake in the past in planting arbor vitæ too closely for a successful hedge. It is quite natural to want a hedge when first planted out, so you put them from twelve inches to two feet apart. I think four feet is near enough to plant arbor vitæ; three is anyway, and I would not put them nearer than four feet. If I were planting them for a hedge I would put them in a ditch, or what we know in farming as a "dead" furrow. I would get the ground in that shape if I had to use a scraper to do it. I would not have the ground level in planting any kind of a tree on our place or anywhere in Minnesota. I want a large basin for the tree, six or eight feet in diameter. I would take the dirt out of the way so I could have a good sized basin if possible to retain the moisture. I do not think it is necessary to water a tree in planting. If the tree is in good condition and the roots are moist when they are put in the ground, and the tree is planted firmly, the roots spread out, I do not think it is necessary to water. If you wish to water it will do no harm if you wait till the next day, or even a week. If you put in too much water you cannot make the tree firm enough, and that is the only way to make the planting successful.

Mr. Dartt: If I were planting an arbor vitæ hedge, unless it was in a favorable locality, I would stop that, and plant the dwarf mountain pine. That is sure to grow if you give it half a chance, and it

will make just as pretty a hedge as the arbor vitæ. It will grow right close up and make close branches. You may not see so much beauty in it as in the arbor vitæ, but at a little distance away it is just as nice, and you can trim it in any shape you want it. If you choose, you can use it for a hedge, or you can let it grow up for a windbreak. I have had the nicest trees ten feet high.

Mr. Lyman: It depends a great deal upon the soil in planting arbor vitæ. If you have a sandy subsoil many of them will die. I have a clay subsoil; and I have never seen an arbor vitæ die. I have a number of trees that were planted twenty years ago, and I never lost one of them.

Mr. Wedge: I would like to ask the president if he would consider that trees planted four feet apart for the purpose of making a hedge would make a good hedge?

The President: I think so, Mr. Wedge; four feet is not too far apart. The branches have only to grow two feet until they are together, and I am sure they do that in a short time. I do not know but what six feet would be about right, they only need to grow three feet to come together, but I am quite sure four feet would not be too great a distance.

Mr. C. L. Smith: I have over forty rods of arbor vitæ hedge. They have been clipped three and one-half feet high, and were set out six years ago four feet apart, and today I know a man could not get through them anywhere. They are solid clear down to the ground, and so thick now a chicken cannot get through. It is clay subsoil, and they are doing well.

Mr. Dartt: I should think it would make a good fence.

Mr. C. L. Smith: My neighbor's cattle get down there sometimes, but they never got through it.

Mr. Bush: I have the same example on my place, and it is entirely practical to plant them that close together; it makes a better looking hedge, and I do not think they are nearly as apt to suffer from drouth.

Mr. Jewett: There is an example of such a hedge at Fillmore. I had occasion four years ago to stake out some ground there, and I had to get down on my knees to punch the chain through. There are twenty-five rods of that fence, and it is so solid a chicken could not get through. A hog would have to root a long time in order to get through it. The hedge is planted around a garden.

Mr. T. T. Smith: Is that all the fence there is around the garden?

Mr. Jewett: There is no protection for that garden on the other side of that hedge, no fence or anything. Mr. Andrews will remember that on the sandy ground just below the hedge died out, but this is on higher ground where there is clay subsoil.

Mr. Andrews: On this lower ground the hedge was planted closer together. The further apart they are planted the better the hedge. I used to plant them a foot and a half apart, but I noticed that those which were planted three feet apart did better.

Mr. Bryant, (Illinois): As a general thing the tendency is to plant hedges too close together for long continued results. We get too much in the ground in a small space, just the same as we get the

trees in an orchard too close together; it may do for a while, but it will not continue long. Where we plant a hedge, we want it to make a hedge at once, just the same as we want to get fruit from a tree we plant at once. We want to get results at once. What I call a reasonable distance is nearer than four feet, and then keeping the plants cut down, and in a short time you will have a magnificent hedge. Somebody in speaking about evergreens spoke about firming the soil thoroughly. Probably Mr. Underwood understands that when nurserymen plant stock in the spring the essential thing is to firm the soil thoroughly. I used to lose a good deal of stock because the men in planting were too careless.

Mr. Harris: My observation in regard to arbor vitæ is that if you give it room enough the lower branches are inclined to grow out horizontally, and the more you clip them the stronger those branches become. Even if planted eight feet apart, in a few years it will make a close hedge. The trouble with a closely planted hedge is that each tree has got to have a certain amount of room for its roots, and if planted too close together those roots will not have a chance to spread and get nourishment, while if planted far enough apart each tree has plenty of space for its roots.

Mr. McGinnis: It has been my fortune to be in countries where they have scarcely any rain fall during the year, and they have remarkable success with trees in those arid climates, and especially where there is not a large body of trees to water. They take a lard can and punch holes in the bottom and bury it in the ground and then turn water into the can. The water percolates from the can through those holes into the soil around the tree, and in that manner they make a great success of planting trees.

OLD FASHIONED PERENNIAL FLOWERS.

MRS. A. A. KENNEDY, HUTCHINSON.

Among my earliest recollections is my mother's flower garden. She was a busy woman and had no time for sowing flower seeds; but flowers she must have, consequently, they were nearly all perennials.

O, how well I remember the large bunch of what we children called "pinys," so large and red! How eagerly we watched for their early advent in the spring, and how pleased we were when we caught sight of the tiny shoots as they awoke from their slumber and came forth with new life! And the old-fashioned Lily! Surely, "Solomon in all his glory was not arrayed like one of these" to our childish fancy. And then there were the Sweet Williams, so bright and fair, and sweet-scented Bouncing Bett, the dainty Pinks, and blue Forget-me-nots. In a corner grew a bunch of Deluce; and every breeze that swept over this, our little eden, came laden with perfume from the little belt of Mignonette And there was the Snowdrop, so pure and white, and the stately Hollyhock. Although there has been great improvement in this flower, does any of them look as pretty to you as those that grew in mother's garden? And last but not least was the towering Sunflower who, from his dizzy height, kept a kindly oversight of his more modest neighbors. In memory of this, my mother's garden, I have in my garden, among my trees, many of those old-fashioned flowers that my mother loved so well, and as I remember them in connection with her they far excel the flowers of today. They only need good, rich soil and a little care to keep the weeds out, and they will thrive.

EVREGREENS ON OUR WESTERN PRAIRIES.

J. O. BARRETT, BROWN'S VALLEY.

While the deciduous species of trees cast their leaves and appear like skeletons in the air, the evergreens are ever clothed with verdure, the more beautiful for contrast with the wintry snow. Having so long tested them, why are we not content with what the providence of nature has given us? All things considered, it is questionable whether we can get anything better than our native grown. One of the duties assigned our experiment station, which it is faithfully discharging, is to test foreign and newly developed varieties from hybridized seeds, to learn if thereby the stock is improved; but it is not wise for us outsiders to do this, because of extra cost and our lack of the necessary facilities. As a rule, what naturally grows in Minnesota thus far proves to be the fittest for the situation.

Can any man give a just reason why the jack, or pitch, pine is scorned as the unfit? It serves a most beneficent use in the tree economy. For a habitat it selects a cold, waste place and there generates a soil for improved vegetation. In thick groves and rich soil, it grows to magnificent proportions, inviting the lumberman for timber. When grown on mountainous heights and gravelly lands, the wood is heavy and surcharged with resin,that is convertible into tar and lampblack of commerce. It is valuable for floors, fuel, and packing boxes. It has a long tap-root like the ash, dipping down deep to find moisture. So tenacious of life is it, that, unlike the white pine, it throws up sprouts in the spring after the stem has been felled, also from the fallen trunk. A coarse, tough tree it is, having dense foliage with long, trailing branches. These characteristics recommend it for a strong, protective windbreak when planted rather thinly to produce low height and heavy trunk, with numerous branches interlocking.

The Scotch pine, introduced from Scotland and other parts of Europe, is another coarse, tough tree. Like the jack pine, it will thrive on lands abandoned during ages of sterility. At forty years' growth, it will change a desert into a green oasis. Its foliage becomes thinner with age, and is not then as pretty as in young life. It is a fast grower, very hardy and makes a good windbreak. Growing in thickets to maturity, its timber constituency is by no means inferior. Preserved in the World's Fair Forestry exhibit of 1893, re-erected in the annex, on the state fair grounds, are very pretty specimens of this wood, presented by Mr. Dartt, who finished a chamber or two of his home, at Owatonna, from boards sawed from trees he planted on his premises and cut when about twenty years old.

In the Norway, or red, pine we have a species of the same genus. It generally grows in clumps, occupying small tracts. Dry and sandy soils do not check its luxuriant growth. For towering up in perfect symmetry of trunk, with rather sparse foliage, it is magnificent. Compact in grain, knit together by resinous matter, when mature it makes substantial masts for vessels and planks for their decks, and is put to many other practical uses. It should and must

be preserved in our native woods and planted with other evergreens by the acre on the prairie.

Every lover of trees knows how enduring and pretty are the red and white cedars. They make nice hedges when kept in good trim. The red species, though never attaining large size in our climate, is the more profitable for furniture. In the early settlements of the state, it was cut for fence posts and fire wood, almost exterminating it. Why not restore this tree alongside of its counterpart, the arbor vitae, to be a healthful defender of stock and home and a source of profit?

The white pine ranks with the "fittest." The vast tracts of this species, centuries old, invited emigration hither, paving the way for the wonderful progress Minnesota has since made. While its wood is intrinsically valuable for a thousand and one structures, its stately trunk, well balanced limbs, and bluish green needles, its hardiness and adaptability to almost any soil, entitle it to vigilant preservation in our native woodlands and extensive culture on our prairies.

Of the spruces, our native white spruce and the introduced Norway lead for hardiness in the open, but the black, or double, spruce raised from seeds in the nursery is prettier, and rightly managed survives on the prairie. A mania prevails that to ensure healthful growth and symmetry we must prune them. This may be necessary sometimes for timber development or when transplanting to equalize the top-wood with the root-wood, otherwise better let well enough alone. When it has plenty of food in ground and air, room and sunshine, and is untouched by saw or knife, it grows into a perfectly balanced cone which no art can excel. But the profit of the spruces is a weightier consideration. Their wood is in great demand for wood pulp to be constructed into paper and innumerable other utilities. In the near future spruce culture by the acre will prove to be the most profitable crop of the farm. Properly cared for, they can be cut for wood pulp when fifteen or twenty years old.

Aside from money or æsthetic considerations, we should prize the evergreens for their sanitary influences. The pines, cedars, spruces, balsams, the latter least valuable of the evergreens, are nature's all cure for human ailments. Sleeping on their boughs, drinking water from the living springs gushing from among their roots, tinged with their elixir, breathing the aroma of the air they refine, are cheaper and surer restoratives than are known in our materia medica. If profit from the enterprise is precious, the healthfulness of the country we live in is far more precious, secured to us and our successors when we engage strong in evergreen culture.

Than the evergreens, no trees better protect our plants, stock and homes on the wide, wide prairie.

It is surprising what a large quantity of berries can be raised on a small plot of ground when highly manured and heavily mulched with old straw or marsh hay. I have known some small patches of blackberries to yield five times as many berries when treated in this manner as the same amount of ground not so managed.

FORESTING IN THE CANADIAN WEST.

D. R. McGINNIS, ST. PAUL.

Possibly some observations on the extent of the natural forests and on the manner of tree planting in the Canadian west on the fiftieth parallel of north latitude from Winnipeg to the Pacific ocean would be of interest to the readers of the Horticulturist.

Roughly speaking, western Canada might be classed as prairie land from Winnipeg west over 800 miles, to Calgary, at the eastern base of the foot hills of the Rocky Mountains; and from Calgary to Vancouver Island, at the Pacific ocean, a further distance of 640 miles, may be generally classed as timbered and mountainous.

In going west from Winnipeg I was surprised to see the large amount of timber in western Manitoba. Quite extensive bodies of timber are generally found over this part of the province, consisting in the main of poplar, or aspen, with small amounts of oak, ash and elm. This country is well settled, and the shelter afforded by the timber is evidently most welcome to the settlers, nearly every house being situated in the protection of beautiful, leafy groves of natural timber.

Notwithstanding the usefulness of the timber, I find that forest fires have in many parts committed considerable ravages, but on the other hand the breaking up of the prairies around these groves has effectually stopped fires, where they formerly ravaged, and the result in many places is a thick, young growth of beautiful, tall, slender trees. Along the banks of the Assinaboine river, the timber is more varied and larger, consisting of basswood, elm, ash, oak, balm of gilead and aspen, with several members of the willow tribe. This timber growth is of considerable size and density, thinning out as we go westward, until by the time we reach Brandon the country presents more of a prairie than a timber appearance. A few miles before we reach Brandon is a tongue of spruce timber, which stretches southward from the Riding Mountains to the Assinaboine river. These spruce trees in this section nowhere become a forest, being found only in scattered groves or singly, but with their exquisitely symmetrical forms they present a most attractive feature of the landscape. Forty or fifty miles north of the Canadian Pacific in the Riding Mountains there are dense forests of tamarac and spruce, which furnish an abundant supply of medium sized saw-logs for a large saw mill at Brandon. Nine miles south of Brandon there is a vast turtle-shaped rise in the prairie, which is a dense forest of aspen, oak and elm. This mountain looks like an island of solid green, rising from the midst of the prairie.

For a few miles westward of Brandon, the country is almost entirely prairie, and the writer began to think he had left the timber for good until he reached the Rockies, but in this he was mistaken. Soon rising out of the prairie were seen isolated groves of from one-tenth of an acre to one hundred acres, and after getting a few miles further westward a section was reached of which at least seventy-five per cent was forest. This country is already fairly well settled, and beautiful farms are being opened up in the openings between the timber. For the next 150 or 175 miles west through the eastern

part of the province of Assinaboine, we found a constant succession of forest belts alternating with beautiful grassy prairies. In this part of the province of Assinaboine there are a succession of great terraces or steps, following each other in succession to higher altitudes as we proceed westward. The largest timber belts appeared to be along the crests of these great waves on the plain. This charming admixture of prairie and forest certainly is a wonderful advantage to the country, furnishing timber, shelter and diversity of scenery to the settlers. Three hundred miles west of Winnipeg we passed through forest so dense that the sun's rays could never reach the ground. The trees are small, but they grow with remarkable density upon the rich soil. It was a source of continual wonder how these forest belts have maintained themselves against the prairie fires which must have ravaged over this country from time immemorial. Yet the trees are there, and their presence is the most positive evidence that the climate is distinctively moist. The last considerable timber belt as we go westward was ten miles wide, just east of the great Regina prairie.

The station of Qu'Appelle, over three hundred miles west of Winnipeg, is situated in the midst of a naturally forested section. I had supposed after we reached Regina that this would surely be the end of the timber, but then for one hundred miles westward here and there over the prairie could be seen a grove of aspen rising above the prairie level. In fact, to a point as far west as Moose Jaw, four hundred miles west of Winnipeg, it was a surprise to find the country cultivated and raising luxuriant crops, and the writer was told by a number of persons well informed in regard to the climate that if the Canadian Pacific road had been built thirty or fifty miles north of its present location, the country could have been farmed every mile of the distance between Winnipeg and the Rockies, over eight hundred miles.

The railroad appears to have paid great interest to tree planting. At the experimental farm at Indian Head, three hundred fourteen miles west of Winnipeg, we find magnificent crops and plantations of trees, which were a delight to the eye and a plain indication of the capacity of the country for tree growing and agriculture. But here again we find the tree growing methods applied by the railroad and the settlers distinctively different from those in vogue in Minnesota and the Dakotas. All trees are planted very closely together for mutual protection and to shade the earth from the sun and drying winds. Not a weed or blade of grass is permitted to grow, the ground between the trees being carefully cultivated at intervals throughout the season. The result is that at Indian-Head, Regina, Moose Jaw and other points, surrounding the railroad depot are beautiful parks of green trees instead of the Sahara of dust and weeds which we too often find around American railroad stations. Close planting and frequent cultivation are responsible for the fact that the writer did not see a dead tree or dead branch or unhealthful tree in any tree plantation on these great plains.

West of Moose Jaw the country becomes considerably drier, and we noted the appearance of varieties of grass peculiar to dry cli-

mates. Nevertheless, there was even here a notable absence of arid characteristics. Trees were not so abundant near by, yet far away southward could be seen the Wood Mountain and the Cypress Hills covered here and there with spruce and pine forests, which are said to be of considerable commercial importance. There is but little doubt that tree growing and even grain raising is quite possible even in this section, which is given up to cattle and sheep ranches. It has been a wet year through this section, the lakes are full to the brim, probably containing more water than they have within a generation, and this condition of affairs we find all the way to Calgary. Between Medicine Hat and Calgary we noted that young trees were spontaneously coming up along the railroad, and we were told that thirty to sixty miles northward of us was the wet belt where the country becomes more or less timbered. From Calgary west to the Pacific Ocean the country at one time has been densely timbered, exeept in the valleys of southern British Columbia, the highest slopes even there being covered with splendid forests. It is needless and painful to refer to the enormous ravages made by the forest fires throughout this six hundred or seven hundred miles. Fires have ravaged from the lowest slopes to the very snow line. Whole sections of the mountainous country are completely denuded of trees.

But the writer was pleased to note that fires do not appear to have made extensive ravages since his last trip through this country nine years ago, and it is an encouraging sight to see thousands of acres of young trees again covering the mountain sides. This favorable condition of affairs arises, he surmises, from the careful attention now being given to the prevention of fires by the Canadian government, with its very efficient mounted police organization. But taking all the damage from fire into consideration, still many millions of acres of the Rockies, the Selkirks, the Gold Range and the Cascade Range are covered with dense forests of deepest green. British Columbia is, in fact, nature's timber storehouse. It is a country of entrancing beauty with its vast mountains, its sublime lakes, its rushing rivers and its mild, moist climate. As we go from the higher levels of the Rockies and Selkirks to the less elevated Gold Range the forest and plant growth assumes a tropical luxuriance in appearance, vigor and density, and the same is repeated as we approach the moist, wonderfully forested Cascade Range. British Columbia made the impression on the writer for being one of the most attractive regions it would be possible to conceive of.

ROAD DUST AS AN INSECTICIDE.—For several years, I have used with good effect road dust against the striped cucumber beetles. I sweep the dust up in the track of the wheels and keep it on hand. Put about four quarts in a loose bag and shake the dust on the plants when they are dry, enough to cover the ground under them. This is also a sure remedy for the little black fleas. I seldom have to dust more than twice.—*O. J. Farmer.*

THE PROFITS OF GRAPE GROWING.

MRS. S. IRWIN, EXCELSIOR.

I have been wondering if our secretary intended to perpetrate a little bit of sarcasm when he chose such a topic for my essay; or if he is really as ignorant of the true state of our grape growing territory as the idea suggests. I tried to get him to change it a little—just a little—out of loving memory of a buried past, but my suggestion was ignored, and so if I must handle the subject I will try to do so tenderly and regretfully.

If I might adopt the story style and be allowed to tell what I know of the fruit business, I should commence with "once upon a time" and tell how Shepherd & Son decorated much of the district south of our street car magnate s residence with the Philadelphia raspberry and sold the products at $6 00 per case and then had to limit their customers; or how O. H. Modlin retailed the same kind of fruit at forty-five cents per quart to the Hennepin avenue grocers and we heard no complaint of the high prices, snide boxes or mouldy berries; while other things too numerous to mention sold at similar prices. Those were halcyon days to fruit raisers, but, alas, we were not "in it," and unlike these pioneers we cannot boast of large margins, the legitimate result of our shrewdness and hard labor, tucked away in the bank of experience? So we will begin our grape talk by "Once upon a time" when all that portion of Minneapolis north of First Avenue North was either up on stilts or floating about among green-coated frog ponds we chanced to have a friend whose husband was dying with consumption locate about where the St. Louis depot now stands. Going over one morning for a call, she said, "Mr. Raymond was really hungry yesterday—hungry for grapes, so I started right down to the bridge square market to get some."

"It is too bad," I replied, "that you could only find those that had been tossing about the country until they were sour and mouldy. If we could only get some nice, fresh ones."

"I did get fresh ones," she answered, "raised right here in Minnesota at a lake about twenty miles from Minneapolis; see, here is the name—"A. W. Latham, Minnetonka."

I hope my friend did not discover the doubt in my mind of such a possibility, but I resolved to spy out the wonderful "Eschol" sometime and see if such a statement could be true, but passing time erased the thought until my next experience, which came about fifteen years ago.

One day we were very much startled to see a large "bus"-looking wagon, with "Minnetonka Grapes" in big letters, drive into the yard, and one of my almost incorrigible Sabbath-school scholars spring from the seat. He had been out at the lake since early spring, "working in a vineyard," he had written, but I had scarcely seen grapes growing in all my life, and my ideas of a vineyard were very vague.

"What a queer looking load you have," I said as we stood chatting in the yard; "what have you in all those baskets?"

"Grapes," he replied.

"All grapes?" I asked.

"Every one."

I began to be interested. "And how many grapes are on the load?"

"Fifteen hundred pounds."

I wished I had kept still, for although it did not reflect very great credit upon my teaching, I knew that the boy did not always copy the example of the "father of his country," and now I had unwittingly tempted him. So I tacked off.

"It must be nice," I said to him, "to market all your crop at once."

"But these are not all," he sniffed contemptuously. "We have a ton coming to-morrow on the train, and that with these will market about half the crop."

"A ton?" I exclaimed. "Oh, Charlie, do you really know how many pounds there are in a ton?"

"Yesum, just twenty hundred," and he fairly howled with laughter at my dismayed look.

So I tacked again. "And how much money do you expect per basket?"

"Well, for these little ones, which are Delewares and weigh five pounds," he said, lifting a cover, "we are to have fifty cents a basket and the large Concords, seventy-five or eighty cents," and his black eyes shone with suppressed merriment. "Oh Mrs. Irwin," he exclaimed at length, "am I such a bad boy that you cannot believe me about just a few of the grapes that are raised about Minnetonka?"

I was perplexed and astounded, and I must confess, half skeptical, and after the boy's departure, took pencil and paper and sat down to estimate the worth of Charlie's crop, if what he said *could* be *true*. But, as I said about raspberries, these were halcyon days, such as come to a country or people about once a century—a thing of the past, an old peg upon which the skeptical can hang fresh made jokes, while we in the rear of grapes for financial profit must use every economy of hired labor, of shipping and selling, if we make them give a financial profit at all. If we are willing to do all the work ourselves, from the beginning in May until the crop closes in October, cultivate, prune, gather, pack and sell, there is yet financial profit on large crops, but if, as formerly, we hire all these things done at the rate of ten and fifteen cents per hour we had all better do as did one of my neighbors—dig them up and make a clover park for the cow.

SHELTER BELTS FOR ORCHARDS.

D. K. MICHENOR, ETNA.

On the subject, "Shelter Belts for Orchards," it seems to me there is not much left to be said, after ten papers have been read.

All admit the necessity of protection for an orchard. The most important thing is the enterprise and push necessary to plant out and care for the trees. The kind of trees to plant depends on location and the expense one cares to incur.

There is nothing better for this section than soft maple. For a small orchard I would want it sheltered only on the south and west; for a large one it would not make so much difference, for the circulation would be all right anyhow.

I think the main benefit of shelter in this locality is to protect the bearing trees from the severe south and west winds that prevail during summer and fall. Only for that, I think if I were planting out a young orchard I would select a high breezy place and let the wind blow.

THE LIMIT OF AGE IN A MINNESOTA ORCHARD.

WM. SOMERVILLE, VIOLA.

To tell the limit of age in a Minnesota orchard would be like a client asking one of our attorneys after the case was submitted to the jury, "how he thought it would go." The answer by the attorney was, it is said: "God knows everything, but I do not think he knows anything about the decision of a petit jury." That is the way with me. I know there is but a small percentage of the trees sold in our state that ever bear. Why is this so? Because there are thousands of dollars worth of trees brought in from other states, many of them dead before they are set out, and the balance not acclimated to our soil or climate. They soon die, and the limit of their age was the time they stood in the nursery row, although planted in orchard form in Minnesota.

Then again there are a few men in our own state that have agents out selling trees, representing them to be Minnesota-grown trees, but when you go to their places, you will find no young trees, only those they have bought and heeled in, and they do not tell you from whence they came. Now, if these men and their agents would tell where they got their trees, they might do a legitimate business without misrepresenting as to where the trees were grown. It is a fraud on the people, as it has been proven beyond a doubt that trees must be acclinated to our or similar climate before we can expect them to live to a great age.

Then the soil, location, protection and general care will lengthen out their lives for years. I believe in evergreen windbreaks or protection, not only from the south and east, but from the north and west also.

I set out some one hundred trees, in 1875, of the Wealthy and Rollin's seedlings and some twenty or more Russian varieties. These last I set promiscuously through the orchard, and they still live, while the hard winter of the eighties killed all the Wealthy and the seedlings except three rows which were close to a northern and eastern protection; they are still alive and bearing. We have a block of fifty Duchess that were set out in '62—I think there are forty-nine in good condition, now bearing fruit for over thirty years. In fact, the first Duchess apples that were exhibited at the state fair came from these trees. But I set them too close for their present age, and the limbs now interlock so that the sun can scarcely shine on the ground. Although bearing fruit every year, being so shaded the fruit does not color or ripen evenly. I have tried the experiment of cutting the tops or old limbs off and letting sprouts come from the stubs of the tops or old limbs and form a new head, which has been successful with me.

FOR GRAPE VINE LEAF HOPPER.—A spray of kerosene and water seems to have no immediate effect upon grape vine leaf hoppers, although this is often recommended. A tobacco extract known as scab cure sheep dip, applied as a spray, has proved fairly successful when used in the strength of one to ten.—*O. J. Farmer.*

FLORAL NOVELTIES.

MISS EMMA V. WHITE, NINNEAPOLIS.

Some one defines novelties thus: "Money makers for some; money losers for others." And doubtless there are those before me who can testify to the rarity of the latter half of this assertion, and, if all the dreadful things we hear said of the tricks of nurserymen are true, you can also verify the truth of both sides of the statement. But are there really new things, new creations in the floral world? Notwithstanding men were told long ages ago by that wisest of wise men that "there is nothing new under the sun," we must assent to the undoubted fact of the new. Since the world began mankind has had an itching for some new thing. A healthy discontent with the present is that which leads to discovery and investigation. And the floral world is not without its discontented ones, its investigators and inventors. It is the crowning glory of man that he can supplement, nay, perhaps improve upon the works of the Creator. God made the rose; man makes an American Beauty. A glance at the history and development of the sweet pea well illustrates this.

The sweet pea was first known in England about 1700, being introduced there from Sicily, the native home of the white and purple varieties. The pink, commonly known as the Painted Lady, is thought to have come from Ceylon. Out from these three first known varieties, with blossoms small and straggling, we find the varieties enumerated today almost by the hundred. The last few years especially have witnessed great development both in variety and substance, and the catalogues of today contain many names unknown three or five years ago. And each year adds still other new names to the long list. There have been undoubted improvements, too. Although the Painted Lady still holds its own among the pink and white varieties, its days are perhaps numbered. The new Blanch Ferry, much like it but with the standards a more varied pink, making a finer contrast and blossoming earlier, it is claimed, is fast pushing it to the wall. In white sweet peas, Blanch Burpee or Emily Henderson, much alike, are now the favorites, and well deserve to be with their good substance and prolific blooming. One of the handsomest new peas I saw last summer was the Stanley, a dark, rich maroon, bearing unusually large blossoms, three and four to the stalk. The Cupid, the dwarf white sweet pea, introduced two years ago and sold at a very high price, has been widely advertised, but it has not given general satisfaction. It is a weak germinator, and especially in our more northern latitudes does not reach its best development. In some places it is much liked, however, and praised as a pot plant. I might speak of many other new varieties of sweat peas of equal value with those already mentioned. In perhaps no other garden flower has the improvement been more marked, and we wonder almost how the future can have anything better in store than the present.

Among the other new things that have pleased me very much of late is the salpiglosis. Though this was introduced from South America as long ago as 1824, it is only within a few years that it has

received more general cultivation. The corolla is continuous and bell-shaped, something like that of the petunia, only the throat is open, and comes in varying kinds of red, orange, yellow, blue, purple, bronze and almost black, all being curiously streaked and penciled. It is an annual, blooming in August from outdoor sown seed. The datura is another comparatively new plant, although allied to the old jimson weed of our gradens. It bears a large, trumpet-shaped flower, five or six inches long and four or more broad, yet it does not seem coarse. It has a delicate odor, and the white ones have a beautifully soft velvety finish. I had in my garden this summer a new variety of datura—a double yellow, the blossom consisting of three funnels, one within the other. It was much admired, and proved much more lasting for cutting than the single. The plant is large and bushy and not very ornamental, and one would hardly care to give it a place in a "handkerchief garden," but where there is plenty of room it can be placed in some odd corner, or by the fence or barn, and will well repay its rent room.

The Japanese morning glory has been much lauded, and the catalogues have heralded it in flaming colors. From my first experience with it this past season—while not altogether satisfactory—I think under proper conditions it may prove all that is claimed for it. I suspect we are a little too far north to see it at its best, which, together with a lack of knowledge of how to treat this semi-tropical exotic, accounts for the dissatisfaction that has oftimes accompanied its attempted culture. The seeds are very hard and the germ needs a little artificial assistance in piercing its shell, otherwise it is several weeks in germinating. I learned this also: Don't sow the seed out of doors until the weather is quite warm. Put in a sunny, sheltered place, and it will grow rapidly and give an abundance of beautiful, large and varicolored blooms along the latter part of the summer. For an early bloomer in this latitude it is not a success, but as a climber it affords abundant foliage, and in my judgment pays the long waiting for its fruition of flowers.

Perhaps no garden flower has been so much improved or developed into a greater number of varieties as the aster. Time would fail me to speak of the many comparitively new and genuinely desireable kinds. Perhaps the best one of all the newer ones is Semple's Branching aster, originated in our own country by an Eastern florist. The flowers are large, as handsome as a chrysanthemum, which they resemble, and borne in abundant profusion. Coming quite late in the season, as it does, it helps with other and earlier varieties to give a very long aster season.

Another handsome addition to our gardens is the California petunia, both single and double, originated by a lady in Ventura, Cal., who spent some seven or more years upon its development. I can not better show its value than by quoting the words of a Maine contributor to Vick's Floral Magazine. He says: "The California petunias are a decided acquisition and take to our ways well. They not only grow stouter and faster than native sorts, but the flowers are much larger and more brilliantly tinted. The seeds germinate better than the common sorts with me, which is an important con-

sideration where every day is precious." These words I can endorse, and I wonder why people will give place to faded out, degenerate petunias, when a little outlay will give a new and brilliantly colored stock.

Time hardly allows me to speak of the new zinnias (those who have visited Como Park within the past two or three years have seen the wonderfully pretty changes in this old fashioned flower), of Allen's Defiance and the Machet varieties of Mignonette with their numerous spikes of fragrant flowers, of the the new varieties of verbenas, hollyhocks, phlox and numberless other well known garden flowers. Referring again to Como Park, I saw there last summer a bed of verbena venosa—something new to me—having a pretty violet or purple blossom, somewhat smaller than an ordinary verbena blossom, but more convex. It is very pretty and deserves a place in our gardens.

While it is undoubtedly true that many of the so-called novelties are only old things under a new name, and also that many come from tropical countries and are not suited to the short summers of our northland, it is also true that very many most desirable things come to us from time to time through the florist's and seedmen's novelty introductions. There is this one characteristic of them all, however, they come high. If you must have them the first year they are advertised, well and good, but if you can have patience to wait a season or so, you will not only avoid unsatisfactory things, as time will witness the survival of the fittest only, but in a season or so they may be bought at more reasonable prices. Perhaps the same laconic advice that droll Sydney Smith gave to a young man who was contemplating marriage may apply to the would-be purchaser of novelties. It was simply, "don't". Wait but a year or two and learn from the experience of others, or be able to make your own experiments at much less cost.

OWATONNA TREE STATION.

E. H. S. DARTT, SUPT.

Secretary Latham:—I think it is wise for our society to allot certain lines of work to our different experiment stations. In this view I suppose this should be known as the girdling station. I have no doubt that more girdling has been done here in the last three years than in all the world besides and beneficial results are becoming very conspicuous in the large number of new seedling apples of great promise that are being brought into bearing, and the more thorough test of old varieties. Previous to girdling we had no way to hurry a variety into bearing except by our laborious method of grafting, which involves the same principle as girdling, namely: interfering with the flow of sap.

Formerly we supposed that the early testing of the size, color and quality of fruit were the only advantages gained by girdling, but now we *know* that while we are inflicting injury to cause early bearing we are testing the innate hardiness of the tree. Just as adversity tries men's souls so girdling causes the premature development of

the tree with all its natural characteristics, and by its aid as much progress can now be made in five years as could be made in fifteen years formerly. Most scientific men say it contravenes nature and is therefore a bad practice. These views I oppose with solid facts. I am using the kodak in the orchard, and with my annual report I will show a section of an orchard row where alternate trees were girdled last season. The girdled trees are now heavily loaded with fruit, whilst ungirdled trees are nearly barren.

GATHERING AND MARKETING THE PLUM CROP.

W. S. WIDMOYER, DRESBACH.

The importance of the plum crop is made apparent by the number of papers devoted to this branch of horticulture at this meeting, and to me has been assigned the subject of "Gathering and Marketing" the crop.

In this, as in all other branches of fruit growing, it is necessary to have plenty of nice, clean packages ready for use before the fruit is ready to ship, as it saves time, annoyance and sometimes money.

By all means pick by hand, as much as possible, and avoid bruising the fruit, especially the thin-skinned varieties; pack and ship nothing but perfect fruit, picking before too ripe, this to be determined by the distance to be shipped and varieties. Some varieties, notably the Japans, must be picked before fully ripe and ripened in the dark, like pears, to get the best results as to quality; also such varieties as Decker's Late can be picked when just turning and quite hard, and ripened up while in transit. I have sent them by mail to New York City, very poorly packed (purposely), and they arrived there in fine condition.

There will be more or less fruit fall to the ground while picking, and be blown off by the wind if left until too ripe. This should be picked up and after being cleaned and sorted it should be sold as near home as possible, as the fruit will not keep as long as that which has been picked carefully by hand.

A good way to gather those which cannot be reached handily is to use a contrivance like an inverted umbrella, such as some use to catch the "*little turk.*" This will catch nearly all the plums and let them run down next to the tree in a pile or into a basket or box.

One of the best packages to ship plums in is the common sixteen-quart berry crate and boxes, if the price obtained will admit of the expense and your dealer can handle them in the boxes. Sometimes dealers refuse to buy them in the boxes, but not often, as they come in better condition and they soon learn the fact. But, sometimes, when the plums are very plenty it is hard to dispose of them in these packages, then we use the common one-third bushel splint market basket for a near-by market.

I shipped in berry crates altogether this season, by express, to St. Paul and Minneapolis, and prices averaged very reasonable compared with that obtained for other small fruit.

Calendar for September.

MARTIN W. COOK.

[This was written by Mr. Cook in 1894, two years before his death. Aside from its practical value, it will be interesting to our members as a reminder of one whom we hold in loving remembrance.]

Small Fruits.—As cultivation stimulates growth, raspberries and blackberries should not be cultivated after September, but allowed then to ripen up for winter. If not already done, cut out and burn all old bearing canes. All pinching or cutting back should have been done early in the season when the canes were one to two feet high, and no trimming should be done after this until laid down in late fall, or when taken up in spring.

Continue cultivating very shallow new beds of strawberries this month. It will pay to cut off all runners after rows are one foot wide, and thin the rows so that plants will not be nearer than four to six inches apart. Much finer fruit can be grown in this way than when the vines are allowed to meet too thickly.

Small beds for family use can be set this month up to the first of October, if good, strong plants can be obtained and the work well done by thorough preparation of land and the careful setting of each plant, and then mulching at once all the ground four inches deep all round the plants with coarse litter from the barnyard, and if dry weather watering them thoroughly. After the ground is frozen, cover plants two to four inches deep with clean straw or very coarse litter.

Old beds intended for fruiting next year that have not been cleaned out and cultivated, as should have been done immediately after fruiting, should be attended to at once—"Better late than never."

Do now as should have been done early in season with the following exception,—cultivate shallow, destroying as few roots as possible. Immediately after harvesting the crop, mow off the beds, not too close, and haul off at once; loosen up the mulch between the rows if any and burn; then with a small plow and a rolling coulter cut down the rows to one foot in width by back-furrowing shallow. You can then weed rows as you think best. Then go over the bed with a planker leveling it down. This will break hard lumps and pulverize the ground. Plow again, without the coulter, a little deeper, throwing dirt on to the rows, and plank again crosswise. This leaves fine dirt on the rows; then with potato hook go over the rows pulling off all lumps and dirt if too deep on the plants between the rows, leaving plenty of fresh dirt on the plants.

After this and at once mulch four inches deep between the rows with coarse manure from the barnyard; also apply a light coat of fine manure on the rows, which will keep the plants from drying up and stimulate the growth and the forming of fruit-buds for the next year's crop.

The above direction can be applied to large or small beds; small beds can be spaded in between the rows two to three feet apart, made straight by a line.

If not already commenced by giving a good coat of fine manure, plowing and spading the ground often so as to destroy all weed seeds, commence at once to thus prepare the land for spring setting of strawberries.

Join the Minnesota State Horticultural Society and get free premiums offered and the monthly Horticulturist, a bundle of good practical information, which, if you practice its teaching you owners of land will be blessed with an abundance of fruit.

Secretary's Corner.

COME TO THE STATE FAIR.—If you aren't interested in the finest fruit display ever made in Minnesota, there are horses and "things" as well. Give the boys and the rest a chance to see the best fair ever held in the northwest.

IS YOUR ORCHARD CULTIVATED?—From the information coming into this office, the writer is led to believe that it is the cultivated orchards that are bearing the nice fruit this year. It may be so next year also, a prophecy it is suggested that the fruit growers ponder upon.

A. K. BUSH A PROSPECTIVE LEGISLATOR.—We are glad to hear of the nomination of Mr. Bush as a candidate for the next legislature, and as the party tendering him this compliment is the dominant one in his section, his election is reasonably assumed. It is pleasant to have a special friend "at court," but as to that horticulture has so many in the state that it would be impossible to elect a legislature not made up of that sort.

MR. DARTT'S COLD STORAGE.—In his largest orchard, Mr. Dartt has constructed an underground cold room in which he has stored some 1,000 bushels of apples, mostly Duchess. Ice by the ton goes into a compartment overhead, and the cooled air slips below and reduces the temperature of the fruit stored there. This is a practicable and not expensive scheme. We must get him to tell us about its construction and workings.

MR. DARTT'S APPLE GATHERING PLATFORM.—This is a cheap and ingenious devise consisting of a two wheel push cart with long handles and a support under the end of each, on which is constructed a light staging of convenient elevation having a platform on its top where the picker stands in gathering apples. With his kodak he may give us a picture of this later in his report. In the meantime get two light wheels and make one ready for harvesting next year's crop.

THE FRONTISPIECE.—The photograph from which the frontispiece of this number was made was taken by Prof. S. B. Green three years since—while Mr. Andrew Peterson, whose figure appears therein, was still hale and hearty. The picture shows a portion of a row of Lieby apple trees he had planted some twenty-five years before. They were and are yet very thrifty and vigorous trees and at that time carried a load of fruit, though on account of the small scale used it does not show well in the engraving. Our readers will recall the death of Mr. Peterson, which took place last year.

BRING YOUR FRUIT TO THE STATE FAIR.—It is hoped this number may not come too late to remind you that perhaps you may have overlooked making entries for exhibiting your fruit at the state fair. If you have never shown anything there, do so this year and plan to spend a day or two there, whether or not, looking over the

horticultural building and talking with the fruit growers who make a veritable hive of it during fair week. You will have the opportunity of the year to get practical information on fruit topics, and if you show any fruit be surprised at the premiums you will get—at least this latter is the experience of most new exhibitors.

THE PROBLEM OF RUSSIAN APPLE NOMENCLATURE.—As we go to press (August 30th) a joint committee from the three states of Wisconsin, Iowa and Minnesota, is in session at La Crosse (the annual fair being on there) wrestling with this bewildering problem. This meeting was originally the suggestion of Mr. Clarence Wedge, who is chairman of the committee representing our own state, accompanied by Prof. S. B. Green and Mr. J. S. Harris. The appointees from the other two states are equally representative, Wisconsin sending Prof. E. S. Goff and Messrs. A. J. Philips and A. G. Tuttle and Iowa Messrs. C. G. Patten, Jerry Sexton and J. B. Mitchell. Prof. Hansen will also be there as representative of South Dakota. This is a notable gathering, and its members are too well known to the horticulturists of the northwest to need any description. It is believed that something may be accomplished at this meeting to disentangle the almost hopeless maze into which the nomenclature of the Russian varieties of apples cultivated in this section has fallen, as a result of the mixture of names accomplished somewhere en route between their native habitat in northwestern Europe and here. Specimens of fruit, leaves, wood, twigs, etc., will be used for purposes of comparison, and the words of knowledge of others on this subject zealously studied in search for the needed light. It is expected that each section of this joint committee will make a separate report to its own state society. They will be looked for with great interest.

DARTT AND HIS OWATONNA EXPERIMENT TREE STATION.—The writer had the pleasure of a flying visit on Tuesday, August 23rd, with Mr. E. H. S. Dartt, at his place in Owatonna. The primary purpose was to "look over" the experiment station, which he is conducting on the grounds of the state school located there, but incidentally many other things were seen and enjoyed in common with Messrs. Wyman Elliot, Clarence Wedge, J. S. Harris and J. P. Andrews, other members of the executive board of the horticultural society. It will be impossible in these notes to say much about the doings at the trial station or Mr. Dartt's private orchards or the man himself who engineers these places. Mr. Dartt is, first, a horticulturist, and second, a real estate boomer, and withal a prohibitionist, and he combines the most radical qualifications of these three phases of his life in the quaint, unique and thorough way in which we have noted his personality at the annual meetings of our association. He evidently believes in doing very well what he does, and this method is sure to bring results, either in growing apples, testing and originating new varieties or shaping up and selling real estate. The things he believes in he does and evidently to the end. He believes in girdling, and his well kept orchards of 2,000 bearing trees and experiment nursery of four or five acres testify to

this most abundantly. From the slight opportunity offered for observations, the writer does not care to pass any private opinions as to the merits of this process, but apparently the girdled trees are as thrifty as the ungirdled (excepting as to blight in some varieties in the nursery) and much more prolific of fruit. Mr. Dartt will undoubtedly carry this experiment—his present hobby—to much length, and his experience gives promise of being a valuable contribution to what is as yet known on this subject. In the meantime he has no patent on the process, but it might be prudent for others to "go a little slow" and await developments.

The writer has only commendation for the condition of the experiment nursery and the methods followed in developing it. From the opportunity offered for superficial examination, they seem to be practical and to give promise of results either of a negative or positive character, and as such of value to northwestern pomology. Here are being tested probably all the varieties of apples being planted in this section and as many seedlings as are obtainable, and the results reached are recorded as the sifting process proceeds. Will the "survival of the fittest" give us ultimately anything of value? That is the problem Mr. Dartt is earnestly trying to solve. Probably other members of the board who spent more time at Owatonna on this occasion than the writer will comment more in detail as to this interesting work.

THE CANADA COLUMBINE.

CHAS. E. PARNELL, FLORAL PARK, N. Y.

The Canada columbine, Aquilegia Canadensis, is a very beautiful native perennial plant belonging to the natural order Ranunculacae. It is one of our prettiest wild flowers, being found in rocky woods throughout northern United States and Canada, where it attains a height of from one and a half to two feet, having bi-pinnate leaves with lobed leaflets. Its period of bloom is during the months of May and June, the individual flower being about one inch in length, scarlet without and yellow within, a rare combination of color.

This columbine takes kindly to cultivation and is much improved by careful culture in the mixed flower border, where it should be given a partially shaded situation and a deep but moderately enriched sandy soil. It should be given a light mulch of some littery material during the winter months, and an occasional top dressing of well decayed manure is decidedly beneficial. Propagation is effected by seeds which may be sown as soon as gathered, or as early in the spring as possible on a nicely prepared border in a shaded situation. Sow thinly, cover slightly, and as soon as the young plants are large enough to handle let them be removed to another border similarly prepared and planted in rows eight or ten inches apart each way. During their season of growth keep them well supplied with water, also clean and free from weeds, and early in the autumn carefully remove them to a permanent position in the flower border. Good strong plants can be procured of dealers in hardy perennial plants at moderate prices, and the plants can also be safely removed from their native homes at any season of the year, except during their season of bloom.

THE MINNESOTA HORTICULTURIST.

VOL. 26. OCTOBER, 1898. No. 10.

HORTICULTURE AT THE MINNESOTA STATE FAIR IN 1898.

A. W. LATHAM, SEC'Y.

Horticulture as a factor in the annual agricultural fair of our state has taken great strides the past few years. At the beginning of this decade the fruit exhibit occupied only a portion of one corner of what was then called Agricultural Hall. Last year, it will be remembered, this department was increased to include about three-fourths of the hall, but its rapid development demanded further extension this year, and, with the exception of a part of one side, the whole hall was taken up by the show of fruits and flowers. There was, indeed, sufficient fruit on exhibition to have filled the entire space had it been arranged in the customary way. In order to make table room to accommodate the anticipated extent of the exhibit, portable shelves were constructed to be placed over the fruit tables. Two out of the three tables in the north end of the hall were surmounted in this way by another table, slightly narrower. On these tables and shelves was spread an astonishing array of apples, grapes and plums, aggregating in all the unexpected total of 5,300 plates, which is practically twice as much as has ever before been shown at our state fair. Not all of this large number of plates belonged to the competitive exhibit, however. About 1,000 plates were shown by the Jewell Nursery Co. in connection with their commercial display and a few hundred by the management on the World's Fair booth. The balance belonged to the competitive exhibit and made a wonderful array. A gentleman who has had much opportunity for observation said it was the finest display of fruit he had ever seen. Probably he did not visit the horticultural department at the World's Fair, but for a state that has the reputation of being a non-fruit producing state, it was certainly an astonishing revelation.

The exact totals of the different classes of fruit as procured by careful computation are as follows: apples, 3,523 plates; grapes, 557; plates; plums, 230; total, 5,301. This shows a small increase in the plum exhibit, and something over 200 plates increase in grapes, the

balance of the increase being in apples. It was unfortunate for this department that the fair was held at so early a date. Apples shown there which were entirely green have since then taken on a beautiful coloring. None of the late ripening fruits were near enough to maturity to give any idea of their final appearance. The Wealthy, which is such a wonderfully showy apple when fully ripe, was only partially colored. Grapes, too, suffered from the same cause, most of the varieties shown being very green.

The personnel in the hall was very much as in past years, though it was sad to note the absence of some who for so long have been regularly with us. There has not been a fair before in many years that we have not seen Michael Pearce's familiar face. Andrew Peterson, of Waconia, too, has been almost as regular an exhibitor. Both of these have died within the past year.

In the awards, Mr. Wm. Somerville received the first premium for collection of apples, J.S. Harris being second and the Jewell Nursery third (a reversal of last year's awards). The sweepstakes exhibit of apples, which was made possible by the premium of $100 offered by John W. Thomas & Co., of Minneapolis, proved to be all the success that was anticipated for it, over 1,000 plates being shown in competition for the premiums offered. Mr. Harris easily carried off the honors of this class, with 415 varieties, to secure which he must have swept the state over with a new broom. Every variety in his exhibit was carefully labeled with its name and the name of the grower and the place where grown, which added very much to the value of the display to those who were interested to study the fruit, as a great many were. The other exhibitors labeled their fruit, too, but some were not so careful to carry out this requirement, and suffered on account of it with the awarding committee. On the whole, there was considerable improvement manifested in getting up and labeling the various exhibits, this year especially showing a large advance over any previous year. A number of the exhibits were especially commendable on this account. Exhibitors will find this to be a great advantage to them in the marking for awards, and it is to be hoped that all will follow these excellent examples, thus adding to the general appearance and attractiveness of the hall.

As usual a few plates of pears and peaches were on exhibition, the latter being from Mr. Peter M. Gideon's orchard, Excelsior. Mr. Gideon also sent down a very interesting collection of seedlings. Col. John H. Stevens brought this display to the hall in person, showing, notwithstanding his infirmities, his old time enthusiasm and interest in horticulture.

Taken as a whole, the arrangements, both on the part of the management and the exhibitors, were a decided improvement over any previous year. The hall was handsomely decorated in the national colors, to which work Supt. Wyman Elliot gave his personal attention, climbing on step ladders and other precarious elevations, like any youth of sixteen.

While it is gratifying to note the increased care with which exhibitors are setting up their fruit, it is very evident that on the part of some, there exists a necessity for greater preparation at home. It

is a mistake to bring in one and the same package varieties of fruit designed for two or more separate exhibits. It is very difficult after reaching the hall to separate one such lot of fruit into two exhibits, especially when they are to be located in different parts of the hall. Some of the exhibitors on this account find it necessary to prolong the time of setting up their exhibits into the afternoon of the second day. If the fruit was prepared beforehand, each variety being placed in a paper bag by itself, it could be placed on exhibition very quickly, but when two collections are placed in one box it is a slow, perplexing and harrassing job to arrange them. Make your selection and do your preparatory work at home, and bring each exhibit in a package by itself. You will enjoy the fair much better, and so will every one else concerned.

The innovation made last year of putting the single plates of fruit classified on a table by themselves was repeated this year with entire satisfaction to all concerned. The little friction necessarily resulting the first time it was tried did not reappear this fall. This plan certainly saves a great deal of perplexity on the part of the judges and gives the public a better chance for comparison. The plan of subdividing can easily be extended, after this experience, as far as may be advantageous.

The Jewell Nursery Co. made the only commercial exhibit in the hall this year. Being located at the north end of the hall, between the two doors, and being very handsomely gotten up, it was a decided ornament and an object lesson in itself. As it is probable that our department will be allowed the entire hall another year, there should be ample opportunity for other such exhibits, and applications for such space could be sent in at an early date.

The florists ornamented the hall in their usual happy way, although the space reserved for them was not all taken up, one of the florists for whom it had been reserved not exhibiting. This was fortunate for the management, as they needed every foot of the space left vacant for the largely increased apple exhibit. A radical change was made this year in the arrangements for the floral display. The high narrow tiers of shelves heretofore used were replaced by three low, wide shelves, raised a few inches one above another. This change was highly satisfactory, both in the saving of labor and in appearance.

The school children made a very nice exhibit, under the management of Mrs. Geo. B. Aiton, on somewhat similar lines as last year, but with considerable improvement in appearance. They were successful in securing twenty prizes.

We were fortunate to have Prof. N. E. Hansen, the horticulturist at the Agricultural College, Brookings, S. D., with us to judge the apples—which proved to be no light task. Prof. Green, who for so many years has passed upon the fruit, thus relieved was made judge of plums, and R. S. Mackintosh of grapes. The awards in the floral department were made by E. Nagel, of Minneapolis.

To those who make a practice of spending some time in the horticultural hall at the state fair it goes without saying that it is a great kindergarten for all interested in fruit growing. The principal

fruit growers of the state are there to stay during the fair, and almost every variety of fall fruit growing in our state is on exhibition. The opportunity for getting information as to varieties, culture and every topic connected with fruit growing in Minnesota is unparalleled. If any of my readers have never taken advantage of this opportunity and are interested to do so, they should not fail to attend the next state fair. The same fruit growing enthusiasts are likely to be there and a similar and, we believe, even larger display of fruit will be made. The purpose of this exhibit is not alone to gratify the eyes of the thousands who pass through the hall, but equally to give an opportunity for the dissemination of correct information on the subject of fruit growing, which is so much needed in our state. Horticultural hall is a great object lesson, and fortunate are all those who have an opportunity to take advantage of it.

What is to be the future of this rapidly developing department? It will be remembered that two years since plans were drawn for a new horticultural building for the state fair. Further experience shows that these plans are admirably well adapted to our purpose, much more so than the present building, and we live in hopes that when the state fair board is prepared to lay out and further beautify the grounds under their care that they will find a location with suitable surroundings, where this or some similar structure that will be an ornament to the institution may be erected for this purpose. It is absolutely certain that it will be needed soon.

AWARD OF PREMIUMS AT MINNESOTA STATE FAIR, 1898.

APPLES.

(Open to all.)

WEEPSTAKES COLLECTION.—J. S. Harris, La Crescent, first, $25.00; W. L. Parker Farmington, second, $15.00; Wm. Somerville, Viola, third, $10.00

SPECIAL SWEEPSTAKES PREMIUM, to be pro-rated according to merit among all competitors in the above competition. J. S. Harris, $33.00; W. L. Parker, $18.00; Wm. Somerville, $15.00; J. A. Howard, Hammond, $10.00; Rolla Stubbs, Hulda, $9.00; R. C. Keel, Rochester, $8.00; C. W. Sampson, Eureka, $6.00; C. H. Murphy, Caledonia, $1.00.

COLLECTION, HYBRIDS AND CRABS EXCEPTED—Wm. Somerville, first, $25.00; J. S. Harris, second, $20.00; Jewell Nursery Co., Lake City, third, $15.00; Clarence Wedge, Albert Lea, fourth, $10.00; W. L. Parker, fifth, $5.00.

COLLECTION OF HYBRIDS AND CRABS—Jewell Nursery Co., first, $5.00; J. S. Harris, second, $4.00; W. L. Parker, third, $.00; Wm. Somerville, fourth, $2.00; R. C. Keel, fifth, $1.00.

SINGLE PLATES.

ANTINOVKA.—J. S. Harris, first, $1.00; Clarence Wedge, second, 75c.; W. L. Parker, third, 50c.

ANISIM.—A. H. Brackett, Long Lake, first; W. L. Parker, second; Clarence Wedge, third.

ARCADE.—Clarence Wedge, first; Wm. Somerville, second; W. L. Parker, third.

BLUSHED CALVILLE.—Jewell Nursery Co., first; J. S. Harris, second.

BOROVINKA.—W. L. Parker, first; Jewell Nursery Co., second; Wm. Somerville, third.

BRETT.—Jewell Nursery Co., first; Wm. Somerville, second.

CHARLAMOFF, PETERSON'S.—W. L. Parker, first; Clarence Wedge, second.

CROSS (413).—Clarence Wedge, first; W. L. Parker, second.

FAMEUSE.—W. L. Parker, first; J. S. Harris, second.

GIANT SWAAR.—J. S. Harris, first; Wm. Somerville, second.
GILBERT.—R. C. Keel, first; Wm. Somerville, second.
HAAS.—W. L. Parker, first; Clarence Wedge, second; Wm. Somerville, third.
KAUMP.—Wm. Somerville, first.
LONGFIELD.—Clarence Wedge, first; J. S. Harris, second; W. L. Parker, third.
LUBSK QUEEN.—Wm. Somerville, first.
MACMAHON WHITE.—J. S. Harris, first; R. C. Keel, second; W. L. Parker, third.
MALINDA.—Clarence Wedge, first; A. H. Brackett, second; Wm. Somerville, third.
OKABENA.—W. L. Parker, first; Jewell Nursery Co., second; J. S. Harris, third.
OSTREKOFF (True).—Clarence Wedge, first; J. S. Harris, second; W. L. Parker, third
PATTEN'S GREENING.—W. L. Parker, first; A. H. Brackett, second; Clarence Wedge, third.
PEACH.—Jewell Nursery Co., first; W. L. Parker, second; R. C. Keel, third.
PEERLESS.—W. L. Parker, first; J. S. Harris, second; Clarence Wedge, third.
REPKA MALENKA.—Clarence Wedge, first; R. C. Keel, second; Wm. Somerville, third.
ROLLIN'S PIPPIN.—W. L. Parker, first; Wm. Somerville, second; J. S. Harris, third.
ROLLIN'S PROLIFIC.—J. S. Harris, first; R. C. Keel, second; Wm. Somerville, third.
SANDY GLASS.—Wm. Somerville, first.
TALMAN SWEET.—J. S. Harris, first; W. L. Parker, second; Clarence Wedge, third.
TETOFSKY.—W. L. Parker, first; J. S. Harris, second; Jewell Nursery Co., third.
UTTER.—J. S. Harris, first.
WOLF RIVER.—Wm. Somerville, first; Jewell Nursery Co., second.
WHITE PIGEON.—Wm. Somerville, first; R. C. Keel, second.
YELLOW SWEET.—Clarence Wedge, first; Wm. Somerville, second.
YELLOW TRANSPARENT.—W. L. Parker, first; D. F. Akin, Farmington, second; J. S. Harris, third.
DUCHESS OF OLDENBURG.—W. L. Parker, first, $1.75; Jewell Nursery Co., second, $1.50; A. H. Brackett, third, $1.25; Clarence Wedge, fourth, $1.00; R. C. Keel, fifth, 75c; J. S. Harris, sixth, 50c.
HIBERNAL.—Clarence Wedge, first; W. L. Parker, second; A. H. Brackett, third; J. S. Harris, fourth; Jewell Nursery Co., fifth; R. C. Keel, sixth.
WEALTHY.—Jewell Nursery Co., first; W. L. Parker, second; R. C. Keel, third; A. H. Brackett, fourth; Clarence Wedge, fifth; J. S. Harris, sixth.

APPLES.

(For Amateurs only.)

COLLECTION, HYBRIDS AND CRABS EXCEPTED.—Wm. Oxford, Freeburg, first, $15.00; Ditus Day, Farmington, second, $10.00; J. A. Howard, Hammond, third, $8.00; W. S. Widmoyer, Dresbach, fourth, $4.00; H. M. Day, Farmington, fifth, $2.00.
COLLECTION OF HYBRIDS AND CRABS.—Ditus Day, first, $5.00; J. A. Howard, second, $4.00; H. M. Day, third, $3.00; Wm. Oxford, fourth, $2.00; H. H. Heina, Lydia, fifth, $1.00.

SINGLE PLATES.

ANTINOVKA.—H. M. Day, first, $1.00.
ANISIM.—H. M. Day, first.
BOROVINKA.—J. A. Howard, first; H. M. Day, second, 75c; John R. Cummins, Washburn, third, 50c.
CHARLAMOFF, PETERSON'S.—H. M. Day, first; J. A. Howard, second; Ditus Day, third.
CHRISTMAS.—H. M. Lyman, Excelsior, first.
FAMEUSE.—Ditus Day, first; Wm. Oxford, second.
GIANT SWAAR.—J. A. Howard, first.
HAAS.—A. D. Leach, Excelsior, first; D. F. Akin, Farmington, second; C. W. Sampson Eureka, third.
KAUMP.—W. S. Widmoyer, first.
LONGFIELD.—J. A. Howard, first; C. H. Murphy, Caledonia, second; C. W. Sampson, third.
MACMAHON WHITE.—J. A. Howard, first; C. H. Murphy, second; W. S. Widmoyer, third.
MALINDA.—C. H. Murphy, first; Ditus Day, second; J. A. Howard, third.
OKABENA.—J. A. Howard, first; Ditus Day, second; H. H. Heina, third.
PATTEN'S GREENING.—H. M. Day, first; A. D. Leach, second; Ditus Day, third.
PEACH.—Ditus Day, first; H. M. Day, second.

PEERLESS.—C. W. Sampson, first; Thos. Redpath, Long Lake, second; A. D. Leach, third.

ROLLIN'S PROLIFIC.—W. S. Widmoyer, first.

TALMAN SWEET.—H. M. Day, first; Ditus Day, second; C. H. Murphy, third.

TETOFSKY.—J. A. Howard, third.

UTTER.—W. S. Widmoyer, first; John R. Cummins, second; C. H. Murphy, third.

WOLF RIVER.—C. H. Murphy, first; W. S. Widmoyer, second.

YELLOW TRANSPARENT.—C. W. Sampson, first; W. S. Widmoyer, second; John R. Cummins, third.

DUCHESS OF OLDENBURG.—C. W. Sampson, first, $1.75; F. H. Gibbs, St. Anthony Park, second, $1.50; A. D. Leach, third, $1.25; R. H. Buttermore, Lake City, fourth, $4.00; W. S. Widmoyer, fifth, 75c.

HIBERNAL.—J. A. Howard, first; H. M. Day, second, H. M. Lyman, third; W. S. Widmoyer, fourth; H. F. Busse, Minneapolis, fifth; John R. Cummins, sixth.

WEALTHY.—J. A. Howard, first; C. W. Sampson, second; W. S. Widmoyer, third; H. M. Day, fourth; Thos. Redpath, fifth; H. H. S. Rowell, Minneapolis, sixth.

APPLES.

(Open to all.)

CRABS AND HYBRIDS.

BRIAR'S SWEET.—Wm. Oxford, first, $1.00; W. L. Parker, second, 75c; C. W. Sampson, third, 50c.

DARTT.—W. L. Parker, first; H. M. Day, second; Jewell Nursery Co., third.

EARLY STRAWBERRY.—W. L. Parker, first; A. H. Brackett, second; Jewell Nursery Co., third.

FLORENCE.—Thos. Redpath, first; W. L. Parker, second; Wm. Somerville, third.

GIDEON'S No. 6.—Wm. Somerville, first; W. L. Parker, second.

GREENWOOD.—W. L. Parker, first; H. M. Day, second.

HYSLOP.—W. L. Parker, first; F. H. Gibbs, second; John R. Cummins, third.

MARTHA.—Clarence Wedge, first; Jewell Nursery Co., second; W. L. Parker, third.

MINNESOTA.—J. A. Howard, first; Jewell Nursery Co., second; W. L. Parker, third.

POWERS.—Wm. Somerville, first; W. L. Parker, second; J. S. Harris, third.

PRIDE OF MINNEAPOLIS.—F. H. Gibbs, first; Jewell Nursery Co., second; A. H. Brackett, third.

SWEET RUSSET.—Ditus Day, first; W. L. Parker, second; Wm. Somerville, third.

TONKA.—A. H. Brackett, first; D. T. Wheaton, Morris, second.

TRANSCENDENT.—H. H. S. Rowell, first; Jewell Nursery Co., second; Ditus Day, third.

VIRGINIA.—W. L. Parker, first; F. H. Gibbs, second; A. H. Brackett, third.

WHITNEY.—Ditus Day, first; W. L. Parker, second; Jewell Nursery Co., third.

SEEDLING APPLES.

COLLECTION, EXCLUDING CRABS AND HYBRIDS.—H. M. Lyman, first, $8.00; Jewell Nursery Co., second, $6.00; Ditus Day, third, $4.00.

COLLECTION OF CRABS AND HYBRIDS.—John R. Cummins, first, $6.00; H. M. Lyman second, $4.00; Ditus Day, third, $2.00.

FALL VARIETY—not sweet, never having received a premium at the Minnesota State Fair.—H. M. Lyman, first, $6.00; Jacob Klein, second, $4.00; H. M. Lyman, third, $2.00.

WINTER VARIETY—not sweet, never having received a premium at the Minnesota State Fair.—Ditus Day, first, $10.00; H. M. Lyman, second, $6.00.

SWEET VARIETY—never having received a premium at the Minnesota State Fair, of such excellent quality as to make it worthy of general cultivation, either fall or winter.—H. M. Lyman, first, $6.00; Jacob Klein, second, $4.00; Ditus Day, third, $2.00.

GRAPES.

(Open to all.)

COLLECTION.—Gust Johnson, Excelsior, first, $20.00; W. P. Rogers, Excelsior, second, $15.00; Mrs. Isabella Barton, Excelsior, third, $10.00; C. W. Sampson, fourth, $8.00; Rudolph Knapheide, St. Paul, fifth, $6.00.

SINGLE PLATES.

AGAWAM (ROGER'S No. 15).—Gust Johnson, first, $1.50; A. H. Brackett, second, $1.00.
BARRY (ROGER'S No. 43).—Gust Johnson, first.
BRIGHTON.—Gust Johnson, first; J. S. Harris, second; W. P. Rogers, third, 50c.
CONCORD.—Gust Johnson, first; Rolla Stubbs, Hulda, second; John R. Cummins, third, 50 cents.
COTTAGE.—Gust Johnson, first; Rudolph Knapheide, second.
DELAWARE.—Gust Johnson, first; Rudolph Knapheide, second; C. W. Sampson, third.
DUCHESS.—Gust Johnson, first; C. W. Sampson, second; W. P. Rogers, third.
EARLY VICTOR.—J. S. Harris, first; Gust Johnson, second; Isabella Barton, third.
ELDORADO.—Isabella Barton, first; Rudolph Knapheide, second.
EMPIRE STATE.—J. S. Harris, first; W. P. Rogers, second; Gust Johnson, third.
GREEN MOUNTAIN.—A. H. Brackett, first; Gust Johnson, second.
HERBERT (ROGER'S No. 44).—W. W. Woodbeck, Excelsior, first; W. P. Rogers, second.
IONA.—Gust Johnson, first; C. W. Sampson, second.
JANESVILLE.—C. W. Sampson, first; Rudolph Knapheide, second.
LINDLEY (ROGER'S No. 9).—Gust Johnson, first; Rudolph Knapheide, second; John R. Cummins, third.
LADY.—W. W. Woodbeck, first; Gust Johnson, second; W. P. Rogers, third.
MARTHA.—Rudolph Knapheide, first; C. W. Sampson, second.
MASSASOIT (ROGER'S No. 3).—W. W. Woodbeck, first; A. H. Brackett, second; W. P. Rogers, third.
MOORE'S DIAMOND.—Gust Johnson, first; J. S. Harris, second; W. P. Rogers, third.
MOORE'S EARLY.—Gust Johnson, first; W. W. Woodbeck, second; Isabella Barton, third.
NIAGARA.—J. S. Harris, first; Gust Johnson, second; W. P. Rogers, third.
POCKLINGTON.—Gust Johnson, first; A. H. Brackett, second; Isabella Barton, third.
POKEEPSIE RED.—W. P. Rogers, second; Isabella Barton, third.
TELEGRAPH.—Gust Johnson, first; W. P. Rogers, second; Rudolph Knapheide, third.
WILDER (ROGER'S No. 4).—Gust Johnson, first.
WOODRUFF RED.—Gust Johnson, first; W. P. Rogers, second.
WORDEN.—Gust Johnson, first; J. S. Harris, second; W. W. Woodbeck, third.
WYOMING RED.—Gust Johnson, first; W. P. Rogers, second; John R. Cummins, third.

PLUMS.

(Open to all.)

COLLECTION—(not in glass, early varieties may have been kept in cold storage.)—Jewell Nursery Co, first, $5.00; A. H. Brackett, second, $4.00; W. L. Parker, third, $3.00; J. G. Bass, Hamline, fourth, $2.00.
CHENEY.—A. H. Brackett, first, $1.00; Mary L. Coffin, Hamline, second, 75c; Martin Penning, Sleepy Eye, third, 50c.
DESOTA.—W. F. Coffin, Hamline, first; A. H. Brackett, second; Mary L. Coffin, third.
FOREST GARDEN.—W. F. Coffin, first; W. L. Parker, second; Jewell Nursery Co., third.
OCHEEDA.—A. H. Brackett, first.
ROCKFORD.—Martin Penning, first; J. G. Bass, second; W. F. Coffin, third.
ROLLINGSTONE.—A. H. Brackett, first; W. F. Coffin, second; J. G. Bass, third.
STODDARD.—W. L. Parker, first.
SURPRISE.—Martin Penning, first.
WEAVER.—Jewell Nursery Co., first; Martin Penning, second; A. H. Brackett, third.
WOLF.—Jewell Nursery Co., first; W. L. Parker, second; A. H. Brackett, third.
WYANT.—Martin Penning, first; A. H. Brackett, second.
SEEDLING—to equal or excel the Desota plum, never having received a premium at the Minnesota State Fair.—August Wittmann, Merriam Park, first, $5.00; J. A. Howard, second, $3.00; Martin Penning, third, $2.00.
PEARS.—J. S. Harris, first, $2.00.

FLOWERS.

(Open to all).

PLANTS.

COLLECTION OF GREENHOUSE AND HOTHOUSE PLANTS.—R. J. Mendenhall, Minneapolis, first, $30.00; Jacob Hartmann, Minneapolis, second, $25.00; John C. Fleischer & Son, St. Paul, third, $20.00; John Vasatka, Minneapolis, fourth, $10.00.

COLLECTION OF FOLIAGE AND DECORATIVE PLANTS.—Jacob Hartmann, first, $20.00, John C. Fleischer & Son, second, $15.00; R. J. Mendenhall, third, $10.00.

COLLECTION OF CLIMBING VINES, FIVE VARIETIES.—John C. Fleischer & Son, first, $3.00; Jacob Hartman, second, $1 00; John Vasatka, third, 50c.

COLLECTION OF FIVE HANGING BASKETS, one of a kind.—John C. Fleischer & Son, first, $4.00; Jacob Hartmann, second, $3.00; John Vasatka, third, $2.00.

COLLECTION OF COLEUS, SIX OR MORE VARIETIES.—John C. Fleischer & Son, first, $2 00; Jacob Hartman, second, $1.00; John Vasatka, third, 50c.

COLLECTION OF TUBEROUS-ROOTED BEGONIAS.—John C. Fleischer & Son, first, $4.00; John Vasatka, second, $3.00.

SINGLE SPECIMEN PALM.—Jacob Hartmann, first, $3.00; R. J. Mendenhall, second, $2.00; John Vasatka, third, $1.00.

COLLECTION OF GERANIUMS IN BLOOM.—John C. Fleischer & Son, first, $4.00; Jacob Hartmann, second, $3.00; John Vasatka, third, $1.00.

TWELVE CARNATIONS IN BLOOM—not less than five varieties.—John Vasatka, first, $3 00.

VASE FILLED WITH PLANTS—At the Fountain in Horticultural Hall.—John C. Fleischer & Son, first, $4.00; Jacob Hartmann, second, $6.00; John Vasatka, third, $3.00

CUT FLOWERS.

ASTERS, not less than six kinds.—Jacob Hartmann, first, $3.00.

CARNATIONS, six varieties.—John Vasatka, first, $3.00; Jacob Hartmann, second, $2.00.

ROSES, six varieties.—R. J. Mendenhall, first, $3.00.

BASKETS AND BOUQUETS.

FLORAL DESIGN.—R. J. Mendenhall, first, $15.00; Otto Hiersekorn, second, $10.00; John C. Fleischer & Son, third, $6.00; John Vasatka, fourth, $4.00.

TWELVE-INCH BASKET OF FLOWERS.—R. J. Mendenhall, first, $5.00; Jacob Hartmann, second, $3.00; John Vasatka, third, $2.00.

PYRAMID BOUQUET.—R. J. Mendenhall, first, $3.00; Jacob Hartmann, second, $2.00; John Vasatka, third, $1.00.

HAND BOUQUET, not over nine inches across.—R. J. Mendenhall, first, $3.00; Jacob Hartmann, second, $2.00; John Vasatka, third, $1.00.

BRIDAL BOUQUET, white flowers.—R. J. Mendenhall, first, $3.00; Jacob Hartmann, second, $2.00; John Vasatka, third, $1.00.

FLOWERS.

(For Amateurs only).

PLANTS.

SINGLE FOLIAGE PLANT.—Mrs. Wm. Wyman, St. Paul, first, $1.50.

SINGLE BEGONIA IN BLOOM.—Mrs. E. G. Batchellor, Bloomington, first, $1.50.

CUT FLOWERS.

COLLECTION OF ASTERS.—Mrs. Geo. Mohler, St. Paul, first, $2.00; Mrs. N. C. Axtell, Minneapolis, second, $1.00.

COLLECTION OF BALSAMS.—Mrs. F. A. Rogers, Minneapolis, first; Daniel Gantzer, St. Paul, second.

COLLECTION OF DAHLIAS.—Mrs. Isabella Barton, first; Mrs. F. A. Rogers, second.

COLLECTION OF EVERLASTING FLOWERS.—Daniel Gantzer, first.

COLLECTION OF NASTURTIUMS.—Mrs. Geo. Mohler, first; Mrs. F. A. Rogers, second; Mrs. N. C. Axtell, third.

COLLECTION OF PANSIES.—Miss Louise Hohberger, Shakopee, first; Mrs. N. C. Axtell, second; Daniel Gantzer, third.

COLLECTION OF PETUNIAS.—Mrs. Geo. Mohler, first; Daniel Gantzer, second.

COLLECTION OF VERBENAS.—Daniel Gantzer, first.

COLLECTION OF ZINNIAS.—Daniel Gantzer, first; Mrs. F. A. Rogers, second; F. Ernest Moeser, St. Louis Park, third.

(The awards for children under fifteen are not available at the time of going to press.)

SHELTER BELTS.

O. C. GREGG, LYND.

The strong prevailing winds which sweep over the prairie regions of Minnesota are continually saying to every thoughtful man, "Make a shelter." When we have stood within the sheltered area of groves and trees, we have thought that the lull of the winds found therein was a lullaby of peace, while the winds which were beat back by the branches and leaves howled their defeat in the tree tops. When one has grown such a protection as that about his home, so that the houses and outbuildings upon his prairie farm are so protected, there is a sense of satisfaction that ranks high among the enjoyments of life. This is very naturally so, because we are by constitution and heredity a race of fighters, and to overcome brings one of the greatest of joys; and when the head is enlightened and the sympathies are elevated, there is found to be a greater joy in overcoming the ruggedness of nature than in the destruction of one's fellowman. So much for the philosophy of the joy found in growing trees upon the prairie.

THE NECESSITY OF TREES.

We have already quoted one, namely, the need of protection about a homestead from sweeping winds that prevail at times, during all seasons of the year. As the prairie sod decays and the land is frequently turned by the plow, the soil which has been held to its place for generations is loosened so that the winds carry much of it away. The only check upon the wastage lies in shelter belts, as well as in a rotation of crops, which includes the grasses (which will do with their roots what the prairie sod does.)

But little if any fruit can be successfully grown unless protected by shelter belts. Every year the good effects of mulching in fruit growing are more manifest, and that mulching cannot be held in place unless applied to ground sheltered by trees. When we speak of a shelter belt as being composed of willows, as we do in this article, then we should not fail to note that it is under their sheltering care that we can grow the more enduring evergreens. Experience has taught us that it is practically a waste of money and time to attempt to grow evergreens without this protection from the hot sweeping winds of summer, but when so protected the evergreen can be very successfully grown.

We think the time will come when a greater number of people will appreciate the value of belts of trees planted about the boundary lines of the farm so as to include about eighty acres in each field, according to the size and plan of the farm. Under the protection of such shelter belts corn will fertilize much better than when planted in the open; grain will not shell out nearly as rapidly as when it stands unprotected from the heavy winds.

The bleakness of the prairie can be greatly enlivened by rows of the golden willow planted for the purpose of a shelter belt. When autumn comes, and it has shed its leaves, then the rich color of the bark, from which it derives its name, is a pleasant feature in the fall and winter landscape.

OBSTACLES TO BE OVERCOME.

I think that the greatest obstacle in the list is the fact that so many farmers of our prairies have come from states where they have been accustomed to cut down trees, or at least their forefathers were tree-destroyers, and it is a difficult task for such an one to reverse the method and begin to grow a tree instead. Until one has set himself about that work, it appears to be a lifelong and endless task to grow trees. Many a man upon our prairies would today have some shelter about his premises, which he has not, if it had not been for this one fact in his mental make up.

The prairies are naturally adapted to the growing of grass rather than to the growing of trees. This is mainly owing to the fact that the climate is more dry than in those sections where trees are naturally grown.

A third difficulty is found in another fact that one must learn how to grow a tree on these prairies; and as he learns he will find that the method is peculiar to the locality, and that certain things must be done that we never thought of as being needful in the wooded districts of the eastern states.

Many a man has tried to grow trees and failed, or the result has been so near a failure that he has become discouraged and ceased to try. This, today, is one of the greatest difficulties in attempting to stimulate a greater effort in tree growing upon the prairie regions of our west.

The lack of knowledge as to what trees should be planted in order to make a success is yet another difficulty in the way. The native trees are found upon the lower lands near the banks of streams. The cottonwood is the largest of them all, and by most has been selected as the tree with which to start the first shelter about the early home. This tree was probably selected because it would start from a cutting, and so the beginning was easily made. Cottonwoods upon the hard, dry prairies of the west are a failure, and many a man looks with sadness upon the dying trees that are dwindling away which were planted by him in his early pioneer days.

THE SUCCESSFUL METHOD.

So far experience has not brought our attention to a better tree for the outskirts of a grove or for shelter belts than the gray willow, and we will add to this (we think with safety) the golden willow, which is an importation from Russia by Professor Budd, of Iowa. These make a great growth quite rapidly. The limbs are pliant and will yield to the strongest wind and then return to their upright position as soon as the storm has ceased. We had a great test of the value of this tree in the fall of 1896, when a storm of sleet fell upon our trees, so that limbs as big as one's little finger were incased with ice the size of a man's fist. The willows which formed our shelter belts were loaded with ice so heavily that the tops bent to the ground. They were so loaded for nearly two weeks, when a thawing period released them from their icy covering and they at once assumed an upright position, standing, on an average nearly

twenty feet high. We have over 200 rods of such willow hedge, and there were not over twenty limbs broken in that whole length. During the past summer season the closest observer could not have noticed a break in that line of limbs and leaves by reason of that fearful storm. While this storm has occurred only once in thirty years, still it is to be remembered that it may occur again, and it is wise to select trees that have the ability to withstand such storms without severe loss or disfigurement. We do not take time to speak in detail of how the cuttings of willows should be planted, as it is a matter which is familiar to all residents of the prairie; but suggest that it is wise to have these willows on the outskirts of the area to be protected, and that there be some three or more rods between the first row and the second row, in which the snow can lie during the winter months and not be heaped upon the other trees that would be broken by the drifts. We also like to have at least a rod inside of the second row of trees that is kept free for the same purpose. We find it advisable to sow these spaces with tame grasses, and so utilize the ground in growing timothy and clover. The grasses grow very well quite close to the shelter belts, and the land is far from being useless.

TREATMENT OF THE WILLOWS.

After the willows have been cultivated for one or two seasons, as the farmer may elect, and the weeds kept thoroughly in subjection, with the ground well stirred so as to prevent the escape of moisture, there will be a very fine growth of young willows. We then like to take the old straw pile and refuse hay and mulch these trees quite heavily, so that no weeds or grass can by any means grow up through it. We crowd the mulch quite close to the willows, but not up against the limbs, and let it extend out from the willows about six feet on either side. This work can be done during the winter and spring months, when work in the field cannot be carried on. Trees so mulched are well cared for. They need no cultivation during the busy season, and they always have a neat and tidy appearance. The ground is always moist beneath this covering of hay and straw, and the willows, even in a dry season, make a most luxuriant growth. We have followed this method for over fifteen years and today we are stronger in our faith that it is a successful method than when we first began. Willows so mulched make an amount of leaf growth that is not found under any other condition that we have seen. We observe that the leaves fairly load the limbs down with their great growth.

It has often been a pleasure for us to stand inside the second row of willows upon our place during the heaviest south winds, and not only be perfectly protected from its violence, but note with pleasure that the strength of the wind had been so destroyed by the outer row that the branches of the inner row only moved lazily under its influence. All trees and fruits within that area were, of course, untouched by the destructive influence of the south wind. As to what I have written regarding the growing of strawberries, let it be understood that it is under such influences as we have described that we have made such a success of that fruit.

ENEMIES OF THE WILLOW.

The large willow saw fly is an insect which has done most of the damage to our willows, but it is very easily overcome by the use of a spraying apparatus. Upon page 384 of the Minnesota Farmers' Institute Annual, notice is made of a spraying pump, called "The Empire King," manufactured by the Field Force Pump Co., 86 Market Square, Lockport, N. Y. We make mention of this pump because it is such a well constructed spraying outfit. It is strong, efficient and of good workmanship. A pump like this, or similar to it, should be owned in every neighborhood upon the prairies, in order to successfully destroy this willow saw fly and another insect, that we will soon refer to. The name "saw fly," as applied to this insect, is apt to be misleading, as this pest will usually be noticed when it is in the form of a large worm, of a greenish yellow color, that rapidly eats the leaves, leaving the branches of the willow bare and unsightly. This worm, as we will now call it, can be very easily destroyed by using one-quarter of a pound of Paris green in fifty gallons of water, and by means of the spraying pump referred to throwing this mixture upon the hedge. This work is very rapidly done, and usually one application will destroy the pest; but if there be any residue, a second application will certainly make it effectual for the season. A few days after the application of the Paris green, those worms will be found lying under the willows, dead and dying.

The aphides, or plant lice, are insects which cause far greater trouble than the saw fly. They multiply so rapidly that in a few days they spread over a large area, sucking the sap from the limbs of the willows to that extent that it causes the leaves to drop upon the ground. If they are allowed to have their way for any length of time, they will certainly destroy the life of the willow by robbing it of its sap. They do their injury during the busy season of harvest and multiply rapidly during those hot days. As soon as one observes that the willows have thin spots in their foliage, then there should be a careful looking into the cause; and if these lice are found upon the bark, as they probably will be, the spraying pump should be called into use at once—not waiting a day—and apply the kerosene emulsion, which is made as follows:

KEROSENE EMULSION

Kerosene, one gallon; soft water, one-half gallon; soap, one-half pound. Boil the soap in the water until it dissolves, and while boiling turn in the kerosene and churn it thoroughly with a syringe or force pump for five minutes, when it will be of a smooth creamy nature. As it cools it thickens into a jelly-like mass. This gives the stock emulsion, which must be diluted with nine times its amount of water before being used on vegetables. All insects breathe through small holes along their sides. The effect of kerosene emulsion is to suffocate them by closing up these pores.

We will add to the foregoing that at times it will be found well that this stock emulsion should be diluted with only one-half the amount of water mentioned. In other words, make the application of double strength.

By following the directions we have herein given, we can see no reason why the homestead and its surroundings may not have this first protection against the prevailing winds, and within their sheltering arms there can be grown the more enduring evergreens and some of the graceful deciduous trees, and with them many fruits for our homes.

THE LAND OF THE BIG RED APPLES.

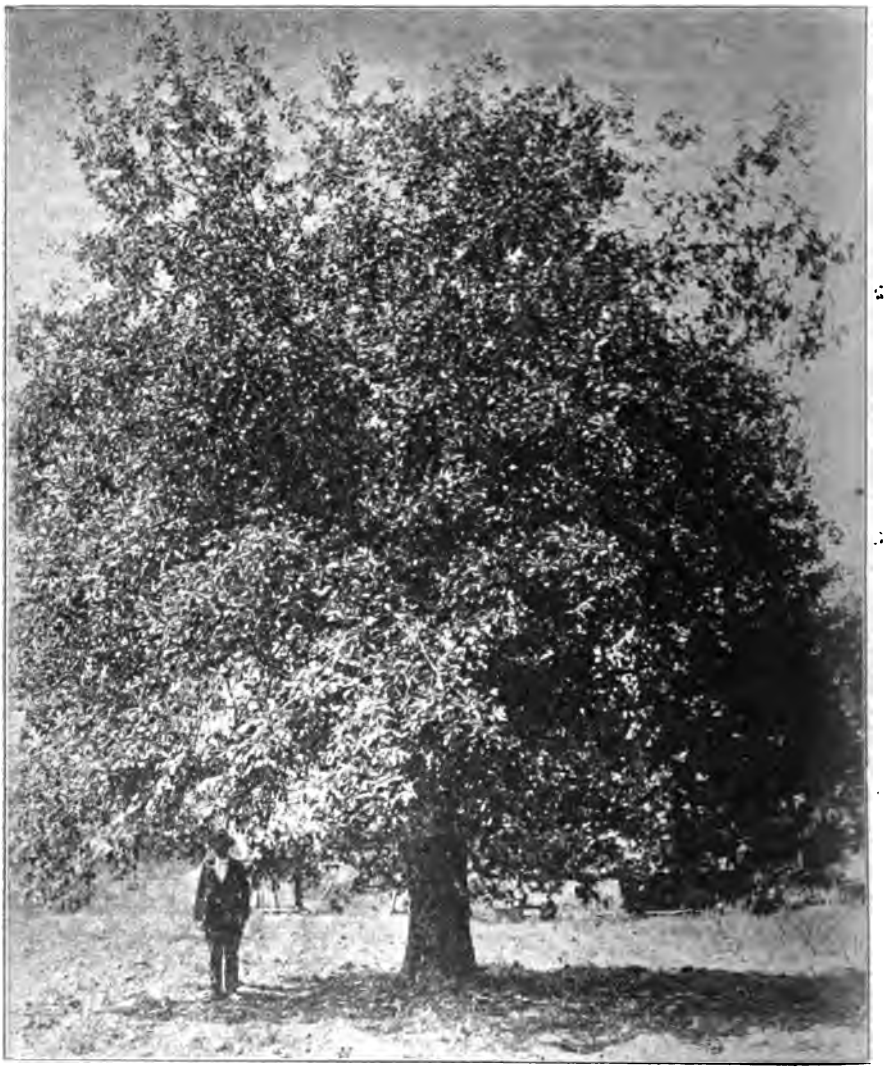
J. S. HARRIS, LA CRESCENT.

From our earliest infancy, now more than three-score years since, we have been an ardent lover of trees, fruits and flowers, and nearly all the years of our life have been spent in planting, cultivating and enjoying them. So intimate has been our companionship with them, those who grow them and the conditions under which they come to the greatest perfection, that we believed we could form a very correct idea of a country or locality and its people by seeing the fruits thereof. When at the World's Columbian Exposition, in 1893, we were afforded the opportunity of seeing the fruits of our whole country brought together in the largest and most complete exhibition of the present age. In all that vast and most wonderful spread of fruits, the magnificent exhibit of apples, pears, peaches, grapes, etc., made by the state of Arkansas, during the later months of the fair, was the greatest surprise and a striking revelation of the capacity and peculiar adaptation of that state for the production of the fruits of the temperate zone. We lingered long at their tables, filled with large and beautiful fruit, visited them often, tested the quality, compared it with other exhibits and felt like shouting "Eureka!" We found none that excelled them, and pronounced the place where they were produced the "Land of the Big Red Apples," the eden of America and the best spot on the continent for the apple, peach and pear, and a veritable paradise for the fruit grower.

Since that time we have desired to visit the place where that wonderful fruit was produced and investigate the conditions under which it was brought to so great perfection, such as soil, climate, methods of cultivation, etc. The opportunity came to us this last autumn. Greatly needing rest and recreation, we left Minnesota on September 21st and sojourned in the "land of the big red apple" for the space of three weeks, just at the time the apple harvest was at its height. The geographical location of the best fruit region is in the northwestern part of the state, comprised in Benton, Washington, Crawford, Madison, Carroll, Boone and adjoining counties. It has an altitude of 1,200 to 1,800 feet above the sea level, and the surface is diversified by hill, valley, table lands and mountains, the very best altitude for tree fruits being about 1,500 feet. The soil, while not as deep and black as on our prairies in Minnesota, is yet very fertile and produces good crops of corn, wheat, oats and most kinds of garden vegetables. Two crops of many of the latter are often taken off the ground in one season, and no one there need go hungry or homeless. The region is, or seems to be, most peculiarly well adapted to the production of fruit. The uncultivated portions are very generally well timbered, the water is good and abundant, and the climate is very desirable, "just lovely." It is said that the mercury seldom drops down to zero in winter, and that the summers are not uncomfortably hot but are very pleasant and much longer than here in the north.

A considerable portion of this country as yet has its resources but imperfectly developed, but to us it appears to have great possibilities in store for the intelligent, industrious and enterprising fruit

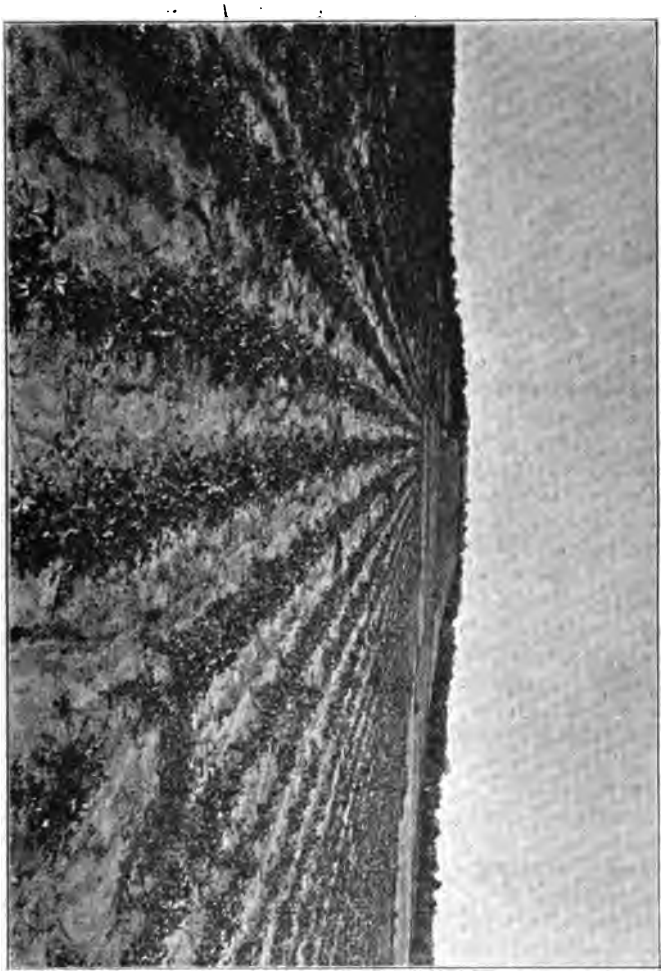
grower who casts his lot there. The greater part of the surplus of apples and peaches at the present time are purchased in the counties of Benton, Washington, Carroll and the northern part of Craw-



THE ORIGINAL ARKANSAS, OR MAMMOTH BLACK TWIG, APPLE TREE.

ford counties, but the other counties named above are equally well adapted to the growing of those two staple fruits. The facilities for transportation to market afforded by the St. Louis & San Francisco R. R. and a branch road from Seligman, Mo., to Eureka Springs, accounts for the greater developments in these counties. No other

fruit region of this country is so favorably located for ensuring a good market for its products, being much more central and convenient to Texas and other gulf states and the Dakotas than California, Oregon and Washington. Southern Texas, Louisiana and, probably, in the near future, Old Mexico will consume large quantities of the apples grown there, and both apples and other fruit of superior



A STRAWBERRY FIELD AT FORT SMITH, ARKANSAS.

quality are always in demand in some other sections of our great country. Fruit trees there begin bearing while yet very young and are very productive. The apples grow to large size and color up beautifully and are of superior quality. They are rich in flavor but not quite as juicy and sprightly as ours, yet better than those grown on the Pacific coast.

This region appears to be peculiarly well adapted to the growing of peaches. Wherever pits are dropped trees spring up, and in two

or three years begin to bear fruit. This is particularly noticeable in the villages, where thousands of trees are seen on vacant lots and uncultivated places. Until quite recently but little attention has been paid to the planting of budded trees, because many of the seedlings are really good, and they cover the season from June to November; but growers are beginning to realize that it pays best to grow only the best and that mixed lots do not take well in the market. The crop this past year was the greatest ever known, and those who had orchards of budded varieties, like Elberta, have realized such profits from them that greater attention will hereafter be shown to the growing of the best budded kinds, and it will undoubtedly soon become the great peach region of the world. Both early and late varieties will be planted; the early to catch the markets of the north and the late for the south. This year the peach shipments amounted to about 200 carloads, divided between four or five shipping points. Within five years it is expected to exceed 5,000 carloads.

The industry of apple growing has already assumed much greater proportions than we had expected. Nearly every farmer in the counties of Benton and Washington has his orchard, and some of them are quite extensive. While we were there, the towns of Bentonville, Springdale, Fayetteville and other shipping stations were virtually turned over to the apple growers. The sidewalks were blockaded with apple barrels and long lines of wagons loaded with apples were waiting in the streets for their turn to unload, and you may well believe that one northerner enjoyed the show and was happy. Careful estimates placed the surplus of merchantable fruit of these two counties at 1,600 car loads, in addition to the large quantities that are canned and evaporated, and that it would net the farmers and fruit growers more than one-half million dollars. This (1897) has been an exceptional or bonanza year for them, owing to their own remarkably good crop and the partial failure of the crops over a greater part of the country. It cannot be expected that such results will be obtained every year, or that every man who engages in the business will meet with such marked success as most of them have this year.

The country is equally well adapted to the production of strawberries and other small fruits. It is but a few years since some one discovered that strawberries could be grown there with phenomenal success and that they could be put into the markets a few hours' ride northward two or three weeks ahead of their home product, and now the industry is assuming gigantic proportions, and plantations are being made of from ten to fifty acres. A good method, too, is in operation there for the distribution of the fruit. It consists of local and county associations as branches of a central association with headquarters at Springfield, Mo. This central organization is to be kept posted on the condition and quantity of the crops through correspondence with the secretaries of the different associations; also, on the state of the markets in different parts of the country through local agents; also to secure favorable transportation rates, negotiate sales, etc., which is expected to in a great measure prevent

the glutting of certain markets and thus ensure better prices. About 10,000 small fruit growers are represented in this country.

The country is rapidly filling up with northern men, who expect to make fruit growing in some of its branches a specialty, and numbers of them will no doubt meet with disappointment, while the majority will do well.

This choice fruit is not produced without using careful and intelligent means. Figs do not grow on thistles or grapes on thorns any better than in other countries, and weeds, briars and bush grow as spontaneously there as in Minnesota. The best paying orchards are cultivated in hoed crops, while young, and as they get older the cow pea is a favorite crop for keeping up the fertility of the soil The peas are planted in rows and cultivated every few days, thus furnishing a dust in connection with the partial shade to the ground. Low-headed trees are much in favor, but in many of the newer plantations the trees are being set too close, both in rows and between rows. It is an invention brought in from the north but a great mistake, as low heads and close planting buck against each other.

The tree agent has been operating there and practiced his art very much as he did in Minnesota. Honest and credulous farmers have been induced to purchase freely at exorbitant prices "budded trees," whole-root grapes, Wolf River apples, the Rocky Mountain hybrid cherry and other fortune bringers. A careful examination of the budded tree shows that even in this favored clime it is not as good as the root-grafted, and other revelations are following as the various high priced fads begin to fruit.

The area being planted to apples and peaches is increasing so rapidly that within the last four years it has about doubled up annually, and the numbers of trees can soon be counted in millions. From present appearance the day is not far distant when there will be nearly a continuous orchard on either side of the Frisco road through Washington and Benton counties.

In peaches the best budded varieties are taking the preference over the seedlings. The newer apple orchards are being planted chiefly to the commercial varieties of winter apples, the Ben Davis still holding the most prominent place. It has been the money maker, but, in our opinion, will have to give place to some of the sweet varieties to satisfy a better educated taste. The Arkansas Black, Mammoth Black Twig, and Missouri Pippin are popular varieties, and it is said that they have some newer seedlings that are about to make a sensation.

KILLING SQUASH INSECTS.—Dissolve one-fourth pound of saltpeter in water. Make a small ditch about the hills of cucumbers, squashes or pumpkins while the vines are small and pour in this solution of saltpeter. It will keep off striped squash bugs and kill the squash or flatiron bug which eats the vines.—*O. J. Farmer.*

MEETING OF JOINT COMMITTEE ON RUSSIAN APPLE NOMENCLATURE.

(Held at La Crosse, Wis., Aug. 30, 1898.)

PROF. N. E. HANSEN, BROOKINGS, S. D.

The Russian apple nomenclature commission, which convened here Wednesday, was able to complete its task more quickly than expected. Much preliminary work had been done, and the careful study necessary to this on the part of each member led to a gratifying unanimity of opinion, so that very few questions remained to be settled in committee.

Wisconsin was represented on this commission by Professor E. S. Goff, of the University of Wisconsin; A. J. Philips, of Wisconsin, secretary of the State Horticultural Society, and by A. G. Tuttle, of Baraboo.

Minnesota's members were Clarence Wedge, of Albert Lea, the president of the commission; Professor S. B. Green, of the University of Minnesota, and J. S. Harris, of La Crescent.

Iowa's members were Mr. J. Sexton, of the Agricultural College, at Ames; C. G. Patten, of Charles City, and J. B. Mitchell, of Cresco; all practical and experienced men.

South Dakota was represented by Professor N. E. Hansen, of the Agricultural College, at Brookings.

Among the great number of Russian apples are found well defined groups or families. By this is meant that some varieties so closely resemble each other as to be nearly or quite identical. Slight differences may be apparent in season, quality, size and appearance of fruit, and in habit and other characteristics of tree, but for all practical purposes they are too nearly the same to warrant more than one representative of the group being put into general cultivation. This cutting down of the list will greatly simplify matters pomological, and the need of it has been long felt.

The following resolution was adopted as a preamble to the groups or families of apples brought under consideration:

"The varieties here grouped as members of the same families while in a few cases different somewhat in characteristics of tree are so nearly identical in fruit that for exhibition and commercial purposes they are practically the same and should be so considered."

In the following lists the word "spurious" indicates that the name preceding it properly belongs to another variety with which it has been mixed.

THE HIBERNAL GROUP.

Hibernal, No. 378; Lieby, or Recumbent, 240; Yellow Arcadian, 327; Juicy Burr, 544 (spurious); Romenskoe, 599 (spurious); Silken Leaf, 75 M; Recumbent, 41 M; Zuzoff (spurious); Pendent Ear; Omensk (spurious); Romna (spurious); Ostrakoff, United States Department, (spurious).

DUCHESS GROUP.

Duchess of Oldenburg; Oldenburg; Arabian, 184; Borovinka, 245; White Krim; Anisette, 185; Glass Green.

LONGFIELD GROUP.

Longfield, 161; 57 M; English Pippin, 587; Good Peasant (spurious); 387 (spurious).

CHARLAMOFF GROUP.

Charlamoff, 262; Peterson's Charlamoff; Champanskoe; Pointed Pipka, 361; Champagne, 112 M. This Charlamoff has proven very valuable in Minnesota. The fruit is roundish, conical, ribbed, mild subacid, and usually a little later than Duchess. The tree is spreading in habit, with lightish cast of foliage, and is entirely distinct from the Charlamoff as grown by J. B. Mitchell and A. G. Tuttle, which is a flat apple of upright habit of tree, and not as valuable as many more of the same season. The Charlamoff of Mitchell and Tuttle, it was decided to name Schroeder's Charlamoff. In other words, two varieties have been imported under the name Charlamoff, and the name is given to the better one of the two.

ANISIM GROUP.

Anisim; 14 M and 18 M of Budd; Zuzoff of Tuttle; Good Peasant of Patten; Boradorfer of Wragg; Peterson's Anisim; Swedish Borsdorf of Patten. This variety is proving very valuable in Minnesota and other parts of the northwest and has been grown in Wisconsin, Iowa and Minnesota under several different names as originally imported from Russia, but which now all give way to the name, Anisim.

REPKA MALENKA GROUP.

Repka Malenka 410; Little Seedling; Green Sweet 169 (spurious). This is a small apple, but is proving hardy and a long keeper. Mr. Tuttle said: "I can keep it through until apples come again. It is fully as long a keeper as Little Red Romanite and much better in quality."

CHRISTMAS GROUP.

No. 310. The variety grown under the number 310 by Mitchell, Peterson, Green and others, was decided to be the true Christmas and a description adopted.

ANTONOVKA GROUP.

Antonovka, 26 M and 236; No. 224; Vargul, 277; German Calville 324 (spurious); Russian Gravenstein, 105; Bergamot, 424.

YELLOW SWEET GROUP.

No. 321; Green Sweet of Patten. Mr. Patten said: "This is one o the freest from blight and one of the hardiest we have, and valuable, though a tardy bearer."

CROSS GROUP.

413 Department. The name Cross was adopted as the official name of the No. 413 of the United States Department, which has also been disseminated under the name of Large Anis. It is distinct from Cross 15 M, 8 M, Skrischapfel and Cross Vor.

ROMNA GROUP.

Romna 599; Romenskoe. The large, round, green winter apples as grown by Mr. Tuttle of Wisconsin under name of Romenskoe, will hereafter be known as the true Romna. This settles the matter definitely, as Hibernal has been mixed with Romna as originally sent out from Russia.

TRANSPARENT GROUP.

Yellow Transparent; No. 60; White Transparent; Red Duck (spurious); Charlottenthaler; Enthaler; Thaler; Erdbeer Streifling; Nitchner's Erdbeer.

ANIS GROUP.

Anis; No. 317; 985, Kursk Anis; Red Anis; 32 M; Russian Green; Blue Anis; Yellow Anis; Pink Anis; Striped Anis; Getman. The Anis is a small apple and appears of value only in latitudes where extreme hardiness is essential.

GOLDEN WHITE GROUP.

Large Long White, 979, of Tuttle and Mitchell; Golden White, 978, of Tuttle and Mitchell; White Russet, 981, of Tuttle and Mitchell; No. 4, Orel, of Budd; No. 5, Orel, of Budd; No. 56, Vor (spurious); Winter Stripe; 15, Department, of Patten. The name does not describe the apple but is adopted until the true name can be ascertained, if possible, from Russian pomologists.

Switzer was moved to be struck off the list as being too subject to blight and the decision sent to the American Pomological Society for use in revising its next list.

Descriptions were made and adopted of all the apples named, also of the following: Long Arcade, Bode, Lubsk Queen, Ostrakoff 4 M, Vargulek 12 M, Sweet Longfield 20 M (Kursk Reinette a synonym), Beautiful Arcade (Repka Kislaya of Speer a synonym).

A WISCONSIN LIST.

Mr. Tuttle, of Baraboo, named the following as the best six of those he has tested, the varieties being in the order of their value: Longfield, a great annual bearer; Anisim; Antonovka; Beautiful Arcade, for sweet; Lowland Raspberry, for best early quality; Repka Malenka, for late keeping.

A SELECTED SHORT LIST.

The Minnesota State Horticultural Society varies this list. At their December meeting only three varieties were recommended for general cultivation, Duchess, Hibernal and Charlamoff, with several in the list for further trial.

The general consensus of opinion of the commission tended strongly in favor of a short list, especially Hibernal, Duchess, Charlamoff, Anisim, Yellow Sweet, Repka Malenka, Longfield, Cross and Christmas. This will simplify matters for the average planter.

Meanwhile a host of seedlings have arisen all over Wisconsin Minnesota and Iowa since the hard winter of 1884-85, and are attracting favorable attention, and it will take another winter such as that

of 1872-73 and 1884-85 to weed out the list and test their true hardiness. This would clear the horticultural atmosphere and make the task of the fruit grower an easier one in the matter of choosing varieties both native and imported.

WHAT THE COMMISSION AIMS TO DO.

The work of the commission was not to recommend varieties for any particular locality, as that must be left to the state and local horticultural societies, but to revise and simplify the nomenclature of the varieties that have come into chief prominence in various parts of the northwest. As opportunity permits the work of revision will be continued.

THE TRANSPLANTING AND SUBSEQUENT CARE OF EVERGREENS.

J. S. HARRIS, LA CRESCENT.

Almost every person can appreciate the beauty of a fine evergreen or, better still, groups of fine evergreens about a country residence. Those who cannot so appreciate and are able to have them, who can be contented to exist in one of the many dreary, desolate, bare and unprotected farmhouses that are so common throughout our state, with nothing like tree or shrub to refresh his eyes or cool the heat of the summer sun, or shield from winter cold, are very far from the saving grace of horticulture.

Evergreens are particularly valuable for the purposes of ornamentation, since they are always objects of beauty, and summer and winter alike they lend us their shelter. For shelter belts and hedges they are far more effective than deciduous trees, because they afford the shelter and protection in winter, when it is most needed. We are glad to note that an increasing interest in their planting as well as in other tree planting, both for ornament and utility, is being awakened.

My experience has convinced me that while evergreens can be transplanted at any season of the year with comparative safety if proper precautions are used, yet the very best time for the operation is May, when the soil has become somewhat warm and friable and the buds are just beginning to start, but before growth has really commenced. If the work must be done before the proper time, say during the fore part of April, the trees should be protected from the drying and cold winds until growth begins, or the result will be that many of them are pretty sure to die. As the name implies, they are always in foliage and present a vast amount of surface, through which the drying winds are searching and evaporating the moisture, causing a severe draft upon the vitality that can be greatly obviated by giving protection. This protection may be burlap or other cloth tacked to stakes driven in on the south, north and west sides of the trees, or a few laths or boards driven into the ground; or old barrels without heads may be set over the trees. Anything that will shield from the bright sun and break the force of the wind will answer.

The best sizes of evergreens to use in permanent timber plantations or for groups for ornament are those from fifteen to thirty inches high. Smaller than fifteen inches are not desirable, and larger than thirty inches are liable to have lost more roots in taking up and be more difficult to protect. They should be nursery grown trees that have been transplanted two or more times to ensure an abundance of roots. Bales of evergreens received from the nursery should be opened at once, the roots wet with water that is not too cold and is thickened up to the consistency of thick paint by dissolving clay in it, and then heeled in immediately into mellow soil until they can be planted. Never allow the roots to be exposed to wind or sun while moving them from the trench to the planting ground, and until they are set keep them covered with wet blankets.

We like best to plant them on land where a hoed crop was raised the previous year and that was plowed in the fall, but if they are to be planted in uncultivated ground larger holes should be dug, and it is better that they be dug the fall previous to planting. In planting, first dig holes ample to receive the roots without cramping. Spread them out in natural position, and work the finest of soil in among the roots using the hands, to make sure that it comes in contact with every root and fiber and that there are no air spaces left, and press very firmly about them. After the roots are well covered, the balance of the filling may be done with the spade, tramping quite firmly but leaving the surface about level, with an inch or so of loose soil on the surface. No manure or soda should be used in the holes or about the roots in planting. If the soil is so wet at the time of planting that it does not crumble freely after being pressed together between the hands or if, as some practice, a bucket of water is turned in after the hole is partly filled, the tramping with the feet should be delayed until the soil has become sufficiently dry—but the hand work about the roots must not be neglected. Set trees about one inch deeper than they stood in the nursery, and it is generally best to apply a mulching of some kind at once.

If the trees were good and well rooted, carefully dug, rightly handled and properly planted, the principal part of the subsequent care is to keep them from being run over or broken down by stock, keeping grass and weeds from robbing them of moisture and an occasional renewing of the mulching for a year or two or a frequent stirring of the surface soil with the hoe or rake. If it should be necessary to water at any time, it should be done at night or when the sun is not shining, and an occasional watering of the foliage with syringe or spray pump, using clean water as warm as the atmosphere and doing it after sundown or on cloudy days, is often very beneficial. Trees taken from swamps or forests or that have not been transplanted in the nursery should be partially shaded until they become well established.

Mr. Somerville: I have had an experience in evergreen growing in the country for sixteen years, and I have never thought it was any advantage to water an evergreen after it was set out unless it was done right. To put water on the surface

of the ground only crusts it over, and evaporation will take out the moisture faster than if it had been left alone. If I want to water an evergreen at all, I want to take the dirt away down to pretty near the roots, and then put in plenty of water, lots of it, and then cover it up with dry dirt, forming a dust blanket to stop the evaporation, and in treating them in that way I never had any difficulty in making evergreens grow. I have at home, I suppose, as many evergreens as can be found on any farm in Minnesota, and I have planted them and planted them successfully, and if it was dry in August I have watered them in that way, by taking the ground away down pretty near to the roots, and then putting on plenty of water and covering with dry dirt, and then mulching. In that way you can set evergreens out successfully, if they have been handled right before you got them. Mr. Elliot's way of handling evergreens is a practical way, and the only way it can be done successfully. There are more evergreens in the section of the country where I live and in my immediate neighborhood than in any other place I ever saw. They have taken a great notion to setting them out there because they are ornamental as well as useful. Around our home we do not know what a blizzard is. We have no drifts of snow around our home. I have evergreens around the orchard, I have them around the garden, around the house and around the drives in such a way that we scarcely know when a hard wind blows. They are from forty to sixty feet high, and they are so thick an animal can scarcely get between them. The best evergreen we can set out is the white spruce. It does better with me by far than any other evergreen I have on the farm, yet I have everything; I have the blue spruce, the Norway spruce, the red cedar, the Colorado blue spruce, and they are all good for protection, but I think more of the white spruce than of anything else I have. The Norway spruce loses its color, but when you have the white spruce it is just as fine in winter as it is in summer, and it grows thicker and closer together. It is an upright grower, and it grows as fast as the Norway. With us the arbor vitæ will not stand the drouth. It is useless to set them out; they have all surface roots. When the ground gets dry they will die out. With the white spruce it is different; that has a tap root that runs down into the ground, and it will live through a dry season almost as well as the red cedar.

Mr. Harris: I cannot see that there is any difference between

Mr. Somerville and myself. I have not time to tell everything I know in a five minute paper. I said watering was better done after sundown, at night or on cloudy days. My method at home of watering is a quicker method than the one he describes I take a crowbar and make several holes through the mulching or dust mulch and turn in the water until I am satisfied it has reached the roots. It is less work than to remove the dirt from the roots and then put it back again.

A SUMMER'S WORK IN HORTICULTURE.

MAX W. BUEL, MINNESOTA SCHOOL OF AGRICULTURE, ST. ANTHONY PARK.

(A record of the year 1897.)

Commencing about the first of last April I engaged to work for the summer in the horticultural department of the Minnesota Agricultural Experiment Station, under the supervision of Prof. Green.

The first work of the season was pruning, and the first to be done were two rows of small white elms, one on either side of the main road leading into the grounds. These trees are in an exposed situation, where they receive the full force of the strong southwest winds which had made many of them lean badly toward the northeast. The pruning of the year before had straightened many of them up, but still there were some which were badly in need of doctoring. In the pruning of these trees it was constantly the aim to prune as much as possible on the northeast side and as little as possible on the southwest, bearing in mind at the same time the precautions necessary to produce an eggshaped top with an undisturbed leading shoot; and still, at the same time, removing enough of the small twigs to avoid a brushy appearance.

In the pruning of all trees there are two general principals which should be borne in mind: first, pruning parts of a tree while dormant tends to increase growth in the part pruned, and, secondly, pruning in the summer during the growing season tends more to decrease growth in the part pruned.

All shrubs which are mostly valuable in ornamental plantings on account of their foliage should be pruned about the middle of spring while those that are used for their blossoms should not be pruned until after flowering, because earlier pruning would greatly reduce the flowering wood.

Cuttings for the propagation of most trees are made in the fall, especially such as privet, which must always be made then so that they may be well calloused to insure growth in the spring. However, some cuttings which grow very easily, such as willows and poplars, are nearly as certain to start when made in the spring as fall made cuttings are.

When cuttings are to be made on a large scale, small branches ½—¾ in. in diameter are made into ten inch lengths, which are tied up one hundred in a bundle with butts all one way, so as to make the planting easier and quicker. Spring made cuttings are kept mois

in a shady place until shipped or planted, but those made in the fall should be buried in sand over winter.

The planting of cuttings is very simple. They are merely thrust into the ground 8 in. apart in rows, leaving only about one or two buds above the surface. The earth is then firmly packed around them and kept free from weeds. Thus thickly planted in nursery rows, they may easily be watered and protected. Later when they have reached some size, they can readily be transplanted to their permanent positions.

Next our attention was called to the seedling plums. We took a bed which had been budded the previous summer and went over it, marking all those in which the bud showed signs of life by cutting off the whole upper part of the seedling, leaving only the main stalk to which the bud might be tied later for support. When the bud did not show signs of life, it was mainly due to two reasons: generally that it had been winter-killed, but sometimes because it had not been properly inserted into the stalk. These seedlings containing the dead buds were cut off quite close to the ground and grafted.

Owing to the fact that all of our cultivated varieties of trees do not come true from seed, or the resulting tree of a seed will not produce fruit with exactly the same characteristics as that of the parent, grafting and budding are used as a means of perpetuating them. Budding and grafting must always be restricted to the members of the same genus or sub-genus. The principles underlying budding and grafting are substantially the same, while the mode of procedure is very different. In both cases the young wood and bark of a scion are brought into such close contact with those of the seedling that a union between the two is usually formed.

Both methods are used to considerable extent in top-working trees. Where the main branches of a seedling are inferior, a hardy variety is budded or grafted in, and these branches are afterward cut off just above the buds, which will then form the entire tree. This method of top-working is very useful under some conditions: for instance, a delicate variety may be grown on a hardy trunk, which greatly diminishes the danger of sunscald or winter-killing, to which the weaker variety would certainly be subject.

Grafting is chiefly done in spring before the leaves appear. The stalk should be somewhat more advanced than the scion for the best results, which makes it necessary to gather the scions the fall before, wintering them over in cool, damp cellar, keeping their butts covered with sand. There are various methods of grafting, such as splicing, inserting in a cleft and many other ways. A graft is usually wrapped in wax to prevent the entrance of air and water, to prevent dying out and also to help keep the scion in place.

Budding is the process of inserting a bud of one tree under the bark of another, where it is held in place until a union forms. It is always done in the latter part of summer or early autumn, when the sap is flowing freely, as this is the only time when the bark and wood of the seedling would separate readily.

When the sap starts the next spring all buds on the seedling should be rubbed off, leaving the nourishment to go into the good shoot.

After the buds are two or three feet high it will be found necessary to give each one a substantial stake to keep it from blowing over, as great damage is often done in this way. It is also sometimes found necessary to stake the branches of old trees which have substantial trunks. This is done to keep the branches from breaking down with the weight of fruit. The same results may be accomplished in years when a great yield is promising by removing about two-thirds of the fruit after it has attained about half size. This not only enables one to remove many of the plums which were injured by the curculios and gougers earlier in the season, but also the fruit which remains will be much larger and better.

Just as the fruit is beginning to set, small round specks and crescent-shaped markings will be noticed, particularly when the plums are a few weeks older. These round specks are the work of the gougers, while the cresent-shaped markings are the trade-marks of curculios, both of which insects do great injury to crops every year. Each one has a separate domain where it lays it eggs and where the larvæ seek their food. The plum gouger lays an egg next to the stone, where on hatching the larvæ immediately enters the pit—which is still soft—and there finds its food. This gives the plum a wormy pit and causes trouble when the fruit is used whole. The curculio lays an egg on the surface of the plum in a small depression and then cuts a crescent-shaped mark between it and the stem, which prevents the flesh from growing over and eventually squeezing the egg to death. It takes a wonderfully fast growing plum to kill an egg in this way.

These injurious insects may easily be battled by placing a couple of sheets under the tree, and giving the trunk and branches a few sharp raps, imitating as much as possible those of the woodpecker. These raps frightens the curculios and gougers, which immediately drop to the ground and are easily detected on the white sheets. On close inspection, they will both be seen to have an elongated snout-shaped head, which gives them the name of snout beetles. The gouger may, however, be easily distinguished from the curculio by the size and color, the curculio being quite small and nearly black, while the gouger is much larger and brown in color.

Pitting plums for seed was a task which occupied a good share of our time toward the latter part of the plum season. When gathering good plums to sell, poor ones were also gathered from the ground, and from these the pits were removed by rotting and washing the pulp away.

Conifera Beds.—In the preparation of conifera beds the soil is one of the most important factors of success, and it should at least be good corn land well plowed and harrowed besides further reduced to fineness by thoroughly raking. In fact, no pains should be spared in getting it into good condition, as this will greatly facilitate the planting of the seed. After it has reached a state of exceeding tilth, it should be made into beds and the seed sown quite thick in rows about six inches apart.

Just as the cotyledons are beginning to appear, a frame should be built over the bed and covered with enough leaves and branches to

shut off about half the sunlight. The seedlings may be allowed to remain in this bed for three to four years, when they should be removed to their permanent situations, where it would be of great advantage to them if they were protected by some deciduous trees for a few years.

Berries.—The shrubby berries most common under cultivation in this state are the blackberry and black and red raspberry. As regards propagation, both the blackberry and red raspberry produce suckers from the roots, and so the easiest way of raising them is to plant these suckers out in a new place. The black raspberry, however, does not produce suckers, and, therefore, varieties of this must be propagated by a different method. This is done by burying the tops of the branches in the ground early in the fall, where under suitable conditions they will have a good root system established before it is time to put down the whole plant for winter. When well rooted, the branch should be cut off, and the new plant is thus formed.

Pruning is one of the essentials connected with the care of berries. In the spring just when the leaves are nicely started, all the wood should be cut back to a strong ,healthy side shoot. The result of this is to reduce the amount of fruiting wood and thus increase the size of the berries. Stopping of the young wood is also a very important branch of pruning, especially as far as blackcaps are concerned. When the young shoots of the year have reached the height of one to one and one-half feet, the tops should be clipped off with a knife. This has a tendency to produce numerous side shoots or bearing wood while upward growth is practically stopped.

The work extended from about the first of April to the first of October, when the fall term of school began.

To one who enjoys practical illustrations, it was time very profitably spent. There were numberless opportunities to put into practical operation the theories discussed in the class-room. To him who has never lived on a farm, book knowledge of horticulture might soon fade away were it not firmly fixed in the mind by actual experience in the nursery and garden.

CHEMISTRY AND HORTICULTURE.

W. R. HERRICK, SCHOOL OF AGRICULTURE, ST. ANTHONY PARK.

The question sometimes arises, "How can chemistry aid the horticulturist?" No doubt the three following ways are among the more important, viz: the precise food value of our fruits, the chemical composition and actual cash value of fertilizers, and the preparation of insecticides and fungicides.

Food value of our horticultural products.—Although we well know of the healthfulness of fruit as a diet, let us study the actual food value. Take, for instance, the Duchess apple. Chemical analysis shows it to contain 83.2 per cent water, 16.8 dry matter, .2 per cent protein, .4 per cent fat, 15.9 per cent carbohydrates and .3 per cent mineral matter; or, in plain English, in one hundred pounds of ripe apple there are 83.2 pounds of water, only 16.8 pounds of solid food, and of this small amount of food there are .2 pounds

of muscle forming nutrients, 16.3 pounds of heat and fat forming material consisting of 15.9 pounds of sugar and .4 pounds of pure fat; there are also .3 pounds of bone forming elements.

Actual human experiments have shown that in order to keep the body in good working condition, the man at only moderate labor must consume .25, or one-quarter, pound of muscle forming food, .25, or one-quarter, pound of pure fat, and one pound of starches or sugars per day. It can thus be easily seen that a bushel of apples would furnish only one-half enough muscle forming food, just enough fat and ten times more starches or heat producing food than the human body requires in one day.

It can not be doubted that the average person realizes that fruit alone is not a proper diet, yet nothing but a chemical analysis will show to a nicety the wide ratio between the muscle and fat forming constituents. Still, when combined with more concentrated foods, fruits are one of the most valuable class of foods which we have. Leaving out of account the actual food value of fruits, the acid they contain appears to tone up the system, and the bulkiness of fruits give to the digestive organs their proper irritation and thus keep them in a healthy state of action. When this is the condition, the system becomes a regular death trap to germs and microbes, and in this age of contagious diseases this is a matter of no small consideration.

Fertilizers.—In the use of fertilizers, chemistry has not been of so much value to the Minnesota fruit grower as it has to those in the eastern and middle states. As we have it here, the horticulturist must be careful to use the barnyard manure on the plants which demand more nitrogen than others, and wood ashes on those needing potash. In the older states it is vastly different. There the farms are small, the land in a low state of fertility, and barnyard manure and wood ashes at a premium. Commercial fertilizers must be resorted to and already are used in the United States to the extent of fifty millions of dollars annually. Perhaps at this point chemistry has proven of the greatest value to the fruit grower, the market gardener and the florist, inasmuch as a chemical analysis shows just which of the many fertilizers on the market is the cheapest and most profitable to purchase. For example, we will suppose that dried blood is selling on the Minneapolis market for $20.00 per ton and nitrate of soda on the same market is worth $60.00 per ton. The question is, "which is the cheaper to purchase?" We simply refer to the table of the chemical composition of commercial fertilizers and find the following: Dried blood contains 10.52 per cent nitrogen and 1.91 per cent phosphoric acid, while nitrate of soda contains 15.7 per cent nitrogen and no phosphoric acid. It can be seen at a glance which is the cheaper, but to be accurate we will figure out the cost per pound of valuable fertilizing materials. Two thousand pounds of dried blood containing 10.52 per cent nitrogen and 1.91 per cent phosphoric acid will give 210 pounds of nitrogen and 38 pounds of phosphoric acid, or a total of 248 pounds of the more valuable fertilizing constituents. In the case of the nitrate of soda, 2,000 pounds containing 15.7 per cent nitrogen will give a total of 314 pounds of the most valuable plant food.

Assuming that market price of the blood is $20.00 per ton and of the nitrate of soda is $60.00, the price per pound for the fertilizing constituents of the dried blood will be eight cents, while in the case of the nitrate of soda, it will be nineteen cents.

Inseticides and Fungicides.—While the chemist may be able to prepare insecticides and fungicides, these are usually suggested by the entomologist after a series of delicate experiments. In this line the chemist usually plays an important part by exposing fraudulent preparations for the destruction of insects and plant diseases. An example will make this point clear. In 1895 there appeared upon the market a material with the high sounding name of "The American Soil Renewer and Insecticide." The chemist of the Minnesota Experiment Station found the material to consist mostly of salt, with the addition of a little land plaster and sawdust.

In many instances the preparations may not be actually injurious to the land or plants, yet in most cases the compounds are nearly worthless, and the prices charged are simply enormous. In one instance, a material was sold for $5.00 per jar, and upon chemical analysis it was found to contain about five cents worth of chemicals which were almost worthless for the purpose for which they were prepared.

In summing up, we find that chemistry and horticulture do, to a considerable extent, go hand in hand and will in due time become more closely related.

CIRCUMVENTING DROUTH.

(The truth contained in this article can not be too often repeated. Sec'y.)

It is impossible to overestimate the importance of thorough, frequent but shallow culture as a means of obviating to a great extent the-illeffects of drouth. In the garden, the field or the orchard it is equally efficacious. Mulching with some coarse material as straw, chaff, leaves, etc., is in most cases really superior to the earth-mulch, but for lack of the necessary material is impracticable on a very extensive scale; while, on the contrary, the earth mulch can be practiced everywhere and by everybody, as well as on as extensive a scale as heart could wish. The feasibility of the earth-mulch at all times and in all places, constitutes it the most valuable of the two methods for accomplishing the same object, viz: the retention of moisture.

According to the exhaustive experiments of Prof. F. H. King, of the Wisconsin experiment station, three inches is the best depth fo the loose dirt, or blanket on the surface. In either the garden, orchard or field, in long continued spells of dry, hot weather, the use of the earth mulch means the difference between profit and loss, success and failure. The dryer and hotter the weather, the greater and more imperative the necessity for a frequent stirring of the surface.

We do not advocate deep culture for any single cultivated plant of our acquaintance. In any and all cases where it is desired to deepen the soil, the deepening process should be put in practice in time of preparing the soil for the reception of the seed, and not in time of cultivating the growing crop. In very hot, dry weather, the soil will dry out just as deep as plowed.—*Western Farmer.*

THE USES OF EVERGREENS ABOUT THE HOME.

F. H. NUTTER, CITY PARK ENGINEER, MINNEAPOLIS.

To the settler upon our western prairies the benefit of a sheltering growth of trees is a question which needs no debate, and the adaptability of our larger evergreens to such a purpose is also admitted, and the different species of pine and spruce are recommended to us according to the varying successes which may have crowned the efforts of those who have cultivated them.

But the subject as announced for this paper turns our thoughts away from the strictly utilitarian side of the question to the ornamental effects to be achieved by the use of this class of trees.

The shelter belt as generally seen is a very formal setting for the home grounds, and while around the vegetable garden and the outbuildings such a border may be most satisfactory, still where it approaches the lawns and better kept grounds which should surround the house itself, an attempt should be made to break up the stiffness of outline into informal groupings, and here the varying species of evergreens lend themselves very kindly to our purpose If the shelter belt be of deciduous trees, an intermingling of evergreens so placed as to develop into their full beauty of form and color will add variety and life to the scene, while if the belt be of the larger and coarser pines and spruces, groups of smaller and more delicate varieties, interspersed with a few light foliaged deciduous trees, as the birch and cut-leafed maple, will serve to unite the grove and the lawn into a harmonious whole.

The beautifying effect of a few evergreens was strikingly shown to me in a recent trip to the northward. After seeing many farms, which, while presenting many gratifying evidences of material prosperity, also stood out in the landscape in varying conditions of bareness and forlornness, we came upon a house whose owner had been fortunate enough to secure a little grove of young white pines in which to locate his buildings, and the home look this imparted to his place was in strong contrast to the appearance of many of the neighboring farms.

To the dweller on the village lot the evergreen comes as a welcome addition to his planting list, and though it may have a hard struggle to overcome the many dangers which beset its way from drought, frolicking children, dogs and general neglect, still if it thrives it will soon become its owner's pride.

Too often the variety selected for planting near the house may in course of time prove unsatisfactory on account of the large size and ragged appearance, but these trees, more kindly than any others, respond to the repressive influences of shears and pinching back.

The idea that because evergreens are often found on apparently sterile soils they do not enjoy and thrive on good living as well as the planter himself is a mistaken one and responsible for many failures. The Colorado blue spruce, however highly colored it may be when transplanted, often on a starvation diet rapidly loses its beautiful tinting. An ample supply of water is necessary for all tree life, and where hose can be used a thorough wetting down of

the foliage of an evergreen is of great benefit as a check to the rapid giving out of moisture to the drying winds.

As has been hinted, many of the standard varieties of evergreens outgrow the places assigned them, but the nursery catalogues give us many kinds which are always dwarf in habit, while a visit to our northern woods may afford us specimens of the savin, juniper and yew, which may be safely used in close proximity to the buildings and if so be that the house may show a considerable extent of stone foundations or, perchance, a rock-faced porch, so popular with some architects just now, some of these varieties close to the mason-work will screen it, as they do the rocky cliffs in their native wilds, and blend the artificial of the building with the natural of the lawn.

While during the summer season our evergreen plantations add grace and beauty to the landscape, it is when shut in by snow and frost that we turn to them with the greatest satisfaction, and in a climate where, whatever the other vagaries of the season may be, winter never fails us, it is no slight recommendation to lend life and cheer to the wintry scene.

For grouping with our ornamental evergreens and to add more vivid coloring, especially when seen against a frosty background we may introduce shrubs and small trees with bright tinted barks, as the white or yellow birch, golden willow and native red-barked dogwood, some specimens of which cannot be excelled by the most brilliant of imported varieties; or berry-bearing shrubs like the bush cranberry, the barberry, the winter-berry (Ilex verticillata), and the well known climbing bitter-sweet, with its scarlet seeds. Such a group within view of the living room window would rob the blizzard and cold wave of half their terrors.

In addition to the many species of the conifera family to which we have heretofore been referring, the dweller in more favored climates has at his disposal a class of plants known familiarly as "broad-leafed evergreens," as rhododendrons, laurels, hollies, etc., which both in the season of snow and the season of flowers add greatly to the beauties of the shrubberies and lawns.

We are at present presumably beyond the limits within which these species can be successfully grown, but it is pleasing to note that cultivation is developing hardy varieties which seem to be better fitted for the vicissitudes of our climate. Even the presence of lime in the soil may not be the evil that it has generally been considered, for I have been informed that Messrs Olmsted & Olmsted, the well known landscape architects, have had careful analyses of various soils made, which showed that some soils in which these plants flourish really contained more of the salts of lime than others in which, for some unknown reason, they will not grow.

Those whose circumstances permit them to indulge in exotic plants and who may wish to decorate their verandas and lawns in the summer time with shrubs of formal appearance, find in the half-hardy hollies, laurels, yews, etc., very attractive evergreens for this purpose. Planted in large tubs and wintered in any cellar which will safely serve as a store room for vegetables, they will live and thrive for years.

To those who can afford none of these things the case is not entirely hopeless, for our northern woods and swamps afford us shrubs which will to a certain extent fill the places of these "broad-leafed evergreens," and a trip to nature's nursery may supply us with specimens of the Andromeda, leather-leaf, Labrador tea, and evergreen dew-berry for our winter garden; and even if our gardening is confined to the restricted limits of a box upon the porch or window seat we may in the bearberry, the partridge berry, the twin flower, the miterwort, and the club moss find humble plants which will respond to our fostering care and speak to us of life and hopes, while all else around us seems wrapped in the death of winter.

THE PLANTING OF TREES AND CARE OF AN ORCHARD.

WM. SOMERVILLE, VIOLA.

The subject given me to write on is one that has been written on and talked about so often in this society that it leaves me little unoccupied ground. I do not agree at all times with some members of the society in regard to the protection and general care of an orchard, yet in one thing we do agree, and that is that apples can be grown in Minnesota and that the most elevated land with northern slope and a clay subsoil is the best location for an orchard. Yet, I think that on any of our high prairie land with a clay subsoil an orchard can be raised successfully without the northern slope.

In setting out a new orchard it is better to have the ground plowed in the fall and plowed deep, and it is advisable to have the trees on hand for spring planting by getting them in the fall. It is a small job to bury them. I do this by digging a hole in the ground the length of the trees and the breadth, according to the number of trees I wish to bury, and two or two and a half feet deep. Put the trees in there, throwing some fine dirt on the roots, never piling the trees above the level of the ground. For fear of mice getting in and girdling them, take corn meal and mix some strychnine or other poison with it and put in some vessel among the trees, and they will be safe. Then take some boards and lay over them and cover with dirt putting some straw or rough manure on top, and they will come out all right in the spring, and you will have them on hand when it is most convenient.

I believe in planting everything as early in the spring as the ground will permit, and especially trees. While the ground is damp from the winter's frost the little rootlets start their growth much sooner than if the ground is dry, and that adds much to the growth of the tree the first summer.

Then comes a question that I have answered a number of times: what kind of trees do we want and of what varieties? Farmers generally want all the wood they can get for their money, which I think is wrong. In my experience, I can get fruit from a good healthy two-year old as well as from a four-year old, and the young tree is more likely to live by transplanting, and in five years will be as large as the other.

As for varieties, I will give those that have fruited in our own orchard, not saying that there may not be other varieties of equal value that have not fruited with us, and not supposing that we have all the good varieties either. I make this selection out of more than two hundred varieties. On the farm, first, we want a few of the Red Duck (a name given by A. G. Tuttle), as its fruit is ripe two or three weeks before the Duchess or Tetofsky. I know of no other summer variety equal to the Duchess family. As for early and late fall varieties, there are a number of them of about equal merit, the Gilbert coming in directly after the Duchess, then the Longfield, then the Wealthy, Rosy Aport, Brett No. 1, Shilonka, Anisim and Patten's Greening. These varieties would constitute a good basis for a commercial orchard, including summer, fall and early winter varieties. For winter varieties I know of no better at present than the Rollin's Prolific, Malinda and Repka Malenka.

We want a good winter apple of the quality and color of the Wealthy and of a good size, that will hang on the tree like the Repka or Malinda till October. This we have not got, or, at least, I have not seen it. Now there are the Okabena and Thompson's seedlings I have not mentioned. They are fine young trees but have not fruited sufficiently for me to give an opinion of their merits. Or the Hibernal, which is one of our hardiest trees and an early bearer, but I do not think the fruit will suit the requirements of the market when there is better.

Now in setting out trees on a prairie soil, I like to set them from six to ten inches deeper than they come out from the nursery row, leaning them always toward the two o'clock sun, as the prevailing winds in summer coming from the southwest soon straighten them up. But if possible keep them well leaned in that direction, and the trees will not scald on the southwest side.

The distance to set them apart would vary, some requiring more room than others, according to their habit of growing. For instance, the Duchess, Hibernal, Patten's Greening and others of that spreading habit require more room than the Wealthy, Repka and other varieties. But if I was to set out another orchard I would mark out the rows nine feet apart, and then set a tree in every other mark, breaking joints, thus leaving the trees some twenty-two or three feet apart. They will soon get close enough. Then plant potatoes, beans, or any hoed crop and cultivate well three or four years or till they come into bearing, and then seed to clover and let the pigs do the cultivating (ringing the large ones), and you doing the mulching. Our Duchess orchard has not been cultivated except by pigs for twenty-five years, and the trees are sound and healthy, bearing fruit every year.

"Who are we to get our trees from?" I answer, "From some responsible nurseryman or his agent," and be sure he has a nursery and raises his trees in Minnesota, so that they will be acclimated.

Although we have had a number of pleasant winters during which almost any variety would flourish, yet we may have and do not know how soon we will get a winter like '83 and '84, and if so there would be a wonderful shrinkage in varieties and death among trees.

There is a difference of opinion among us in regard to windbreak around an orchard. In my opinion it is the safeguard to fruit growing, but I do not want it of willows or cottonwood unless at least five rods away from them. Some of our best trees and largest fruit grow within less than one rod of our evergreen hedge.

As for pruning, I do it at any time of the year when going through the orchard. If limbs cross I cut them off so they do not run together, but if I want to do a heavy pruning to large trees I do it in the winter, so they will not bleed.

As for girdling trees my experience differs from Mr. Dartt. I think it a dangerous experiment in an orchard. Years ago while in the nursery business with A. W. Sias, and experimenting with everything like an apple we could get hold of, we frequently girdled three-year-old trees to see what kind of fruit they would bear; we would always get a few apples, but it was generally at the loss of the tree, as it was not salable afterwards, and frequently it would die. We found out that some varieties would live but be unsalable, while other varieties it would kill. I girdled a few trees in our orchard the 16th of last June, and there is not one that I girdled but is injured by leaving a black or dead spot where I girdled. Some I entirely killed, and I learned the lesson that when we violate nature's laws we must pay the penalty. If I had some old trees that would not bear fruit and did not care whether I killed them or not, I would girdle them, but a young orchard, never. It is a dangerous experiment.

THE USES OF SHELTER BELTS.

ALFRED TERRY, SLAYTON.

The uses of shelter belts are manifold. Living as I have for twenty-six years on the prairies of southwestern Minnesota, I well remember when it was an unbroken wilderness, except that here and there were unsheltered farm buildings, whose very presence seemed to betoken misery and hardship. The cattle in winter were bow-backed and shaking, too cold to move about and too lean to ship to market; the pigs made audible remonstrance against the absence of shelter; the chickens staid on the roosts till noon to keep warm; the wooly sheep refused to bleat; the boys neglected much of their chores; while the farmer himself was driving to town for fuel, facing an unbroken wind from the northwest. Oh, think of it, that sharp, stinging, biting, freezing wind, made worse by the steady sweep of a drifting snow which had fallen a week before, but since been frozen and re-frozen till granulated finer than the desert sands, and combined with the wind and cold to multiply the misery of both man and team! Double clothing and fur overcoat and shoe packs burdened the body by their weight but failed to shelter it from the wintry blast. The picture is not overdrawn. The good wife had to chink with cloths the threshhold of the best made doorways and stuff the key holes with rags, and keep up a raging fire to save the children from suffering.

I have often seen such a picture on the very spot where now stand the same buildings, with a few more added to them, and surrounded

by an artificial grove, consisting of a variety of trees from eighteen to twenty-three years old. Now, through winter the fowls are scattered over the place from morn till eve; the snow melts more or less every day; the slick, fat cattle show feed, care and contentment, and are sought after by the cattle buyer; the pigs rise three times daily and eat and exercise, and the rest of the time are lying in silent sleep; the boys (now the grandsons), rise early and take plenty of time to do the chores, and themselves go to town with grain and return with fuel, while the old man, accompanied by his wife, drive with pleasure to a neighbor's or to the city. This happy change has been brought about by the shelter belt raised around the farm building and the many found along the road.

The shelter belt is of use to beautify the farm, to make stock raising profitable and farming enjoyable. Combined with fodder and grain, stock is made to prosper and the farmer to succeed. As shelter belts increase, the landscape improves, the moisture of the atmosphere condenses, the land becomes more moist, and the soil becomes more fit for agricultural purposes. The higher priced crops as well as corn, the king of all crops and the farmer's wealth maker, will be increased in yield. Shelter belts, by breaking the wind, as well as by increasing moisture, ameliorate the climate and transfer us to more southern climes without changing our latitude. And shall I forget the feathered army that comes to us when we supply them homes among the trees? The fruit raiser knows the benefit of birds to his land. 'Tis true they eat his fruit, but see them in the spring hunting in every nook and corner from sunrise to sunset the insects that trouble the grower most! How we enjoy the singing of the robin and the thrush, and look with delight upon the plumage of the oriel, blue bird and wild canary! The uses I have mentioned are but a beginning. Like cultivation itself, it improves with use, and as our shelter belts grow thicker and taller the population increases and the demand for timber, such as hoop-poles, osiers, etc., increases, and the groves themselves become the direct producers of incomes.

THE EVOLUTION OF A SCHOOL OF FORESTRY IN THIS STATE.

PROF. S. B. GREEN.

I believe such a school is now being developed and the movement may seem to be going slowly, I think it is keeping pace with the demands in this line. It is the policy of the university to meet the demands of the people for higher education of special value in the development of the resources of our state and it will not be behind in meeting any call there may be for special instruction in forestry.

In considering this subject, we should study the extent ot the present demands for forestry instruction in this state. We have here two forest problems, one of which concerns the planting of trees upon our prairies and the other the care and management of our great forest resources. The prairie population is interested in tree planting and is wide awake to the needs of improvement in

methods of prairie planting. But after all, this is rather a simple matter and does not call for the establishment of any special school, since the instruction necessary for a proper understanding of the subject may be given in a few terms' work in our school of agriculture and by bulletins of the experiment station.

The problem of the proper management of our great forest resources is of much more importance to our state and should demand our most careful attention, but the price of forest products is so low, the profits on growing trees so small and long delayed, the risk of destruction by fire is so great and the taxes on timber lands are so high that there seems to be every discouragement to the investment of capital in young timber with a view to its proper management for increase. These and other facts with which you are familiar make it evident that our people know little and care less about management of our forests and that until they are better informed about these most fundamental principles there is little use in attempting any but the most simple methods of management. These principles may consist of protection from fire and attention to some of the simplest methods of restocking the land. The carrying out of such primitive ideas would not make a call for much skilled help, even if the state and all the owners of forest lands were convinced of its importance, which is far from being the case at present, and in the necessarily slow introduction of even these simple methods the owners of forests will largely do their own supervision and carry on the work with their present help.

The situation here then, in my opinion, is that there will be little call in this state for advanced education in the principles of good forestry for some years to come, and I see no need for the establishment of a school of forestry in this state at present, for the graduates of such a school could not find profitable employment in their profession; nor do I think that the needs of prairie and timber forestry combined require the immediate establishment of such a school. But while I do not think it is necessary to add another professional school to the university for instruction in forestry, I do think that its fundamental principles should be looked upon as an important part of university education, and I believe the time will come when as a result of enlightened ideas, of a more intense cultivation and the increased price of timber, the subject of forestry will be taught in a special school in the university—but the time is not ripe for it now. The evolution of this school has already begun, and it will advance according to the needs of the situation. For nine years, forestry has been taught as a separate subject in the school of agriculture and has had equal rank with horticulture. This time could now be increased to good advantage. In the university, botany, geology, zoology, entomology, physics, chemistry and other subjects which form an important part of the curriculum in forestry schools are taught; and there are offered one, two or three terms of special forestry studies. From this, it will be seen that all that is necessary to make a special school of forestry in the university would be the addition of more forestry studies and especially of better opportunities for making practical experiments in forestry.

Calendar for October.

PROF. S. B. GREEN, ST. ANTHONY PARK.

While the ground may remain open until some time in November, yet I have found it safe in this section to plan to close up the working of the land by the 20th of this month. Among the things that will require attention before that time will be the pruning and covering of grapes, the covering of raspberries and blackberries and other plants that are likely to be injured by the winter.

I found that such varieties of gooseberries as the Downing, which is a little tender in its fruit bud, and Fay's Prolific currant, which is likewise tender, are greatly improved by being covered in winter. Some of our shrubs also are greatly benefited by a little winter protection, especially those that were set the previous spring, since they are not as hardy the first winter after being transplanted as in subsequent years.

The land that is to be worked early in the spring should be plowed this fall. This cultivating of surface soil protects from winter drouth, and while it is not perhaps so important to protect from winter drouth as from summer drouth, yet it is desirable to save as much moisture in the soil as possible.

Apple trees should be banked up with a few spadefuls of earth to protect them from mice. Where jack rabbits are troublesome, good protection is afforded by painting the trees with a paint made of Portland cement and skimmed milk containing about a tablespoonful of Paris green to a pail of the mixture. This does not injure the tree, stays on well and affords excellent protection.

During the first half of this month is the best time for planting red raspberries, blackberries, currants and gooseberries. They seem to do much better when properly planted in the fall than when planted in the spring. Proper planting of these consists in firming the soil compactly around the roots, and then after planting putting a spadeful or so of earth on top of each plant and later on a little mulch. Treated in this way the chances of loss are very slight indeed, and even blackcap raspberries may be planted in this way with very good success.

Apple and plum trees may also be planted in the fall with success if, after planting, the tops are bent flat on the ground and covered entirely with soil and then the roots of the plants are well mulched on the approach of winter. While this makes more work in planting than would be necessary in spring planting, yet it is at this season of the year that we are apt to have a little spare time, while in the spring the work is apt to crowd us. Currant, willow and other cuttings may now be made and planted out and covered and mulched as recommended for newly set raspberries.

This is also a good time for digging around and manuring currants and gooseberries, but the manure should be worked into the soil.

Tulips, crocuses and daffodils for early blooming should be planted at this time, and beds of them make a very pretty showing

early in the spring. Such beds should be mulched during the winter.

In the vegetable garden the celery should be kept well banked up until taken in, or else it should be well covered with good mulch to protect from severe frosts.

Root crops should be out of the ground by the 20th of this month and stored either in pits in the field or put into a root cellar. It is a good plan in preparing the root cellar for storage, after cleaning it out to burn enough sulphur to fill the air thoroughly with its fumes. This destroys many of the rot-producing germs and aids some kinds of vegetables in keeping.

It is important to gather squash before there is any danger of its being frosted ever so little, and it is well to remember in storing squash that it needs a dry place, and that it does not make so much difference about being warm as being dry. A very hot room will keep squash in good condition if it is kept dry, while if moist it cannot be kept at any temperature.

If the weeds along the headlands and highways have not been cut the latter part of this month, there will be a little spare time when such things should be done. While there may not apparently be any money in it, yet it gives an appearance of tidiness and thrift that has a helpful effect.

ARTIFICIAL FOGS.—The newest method of protecting orange orchards against frosts, consists in creating an artificial fog, which overhangs the trees and keeps them from harm. It is a fact familiar enough that there is no danger from frost on a cloudy night; the clouds prevent the rapid radiation of heat from the earth, and thus serve as a sort of blanket. A fog, which is an earth cloud, serves the same purpose.

The orange growers of California have found out a way of making fogs by artifice. They can create them at any time within a few minutes. If the night starts in clear and cold, with prospects of frost, the fog-making machines are turned on, and very soon the orchard is enshrouded in a deep mist. Thus protected, the trees can defy even a severe frost, which under ordinary circumstances would destroy all expectation of a crop.

The orchard provided with the fog-making device is underlaid by a system of small pipes that carry water; connected with these are perpendicular pipes, which rise to a height of forty feet in the air. There are 100 of these perpendicular pipes in every ten acres of trees. At the top of each tall pipe are a couple of "cyclone nozzles," which discharge the water in a fine spray in an upward direction. All that is required is that the water should be turned on and the air is charged with a fine, fog-like mist.

All the underground pipes in the orchard unite in one common supply pipe, which passes through the house of the watchman in charge. At any time when the temperature sinks to freezing point the watchman, by opening the cock of the supply pipe, can at once turn on the water to all the pipes and spray nozzles. The result is a thick fog, thrown by 100 cyclone nozzles over the entire ten acres. The mist soon fills the air to a height of forty-five feet, and any breeze drifts it about like a bank of fog.

In connection with the apparatus is an alarm thermometer. When the temperature in the orchard falls to 32° an electric circuit is completed and an alarm wakes up the watchman. Without delay he turns on the fog and then goes to bed, satisfied that the orchard is safe.—*N. Y. Journal.*

Secretary's Corner.

ARE YOU STUDYING YOUR WINTER TOPIC?—This is to remind those on the program for the next annual meeting of the value of early preparation.

MEMBERSHIP FOR 1898.—The annual membership of our society for 1898 has now reached the number of 719 and is likely to round out the full 800 when the list for the year is complete. In estimating our full strength the number of life members is to be added to this.

WAX MODELS OF MINNESOTA APPLES.—Selected specimens of the more successful varieties of apples in our state have been sent east to an expert in this work and a case of models, adapted to the climate, will soon be added to the possessions of the horticultural society—so the editor understands it. Prof. Green is attending to the matter.

FROM HAMPSHIRE CHRONICLE, AUGUST 13, 1898.—"The famous vine at Hampton Court Palace, which is now 130 years old, is bearing 1,200 bunches of fruit. The grapes are just beginning to ripen, and in three weeks' time the fruit, which is saved for use at the queen's table, will be fully matured." I have seen this vine many times.

Slayton, Minn., Sept. 15, 1898. ALFRED TERRY.

A PROFITABLE ORCHARD.—The Winnebago City Press News says that Fred Sholl raised this year 1,000 bushels of apples, and Mr. Holley, on the farm adjoining, 2,000 bushles, selling at 75 cents per bushel.

There are many such orchards now bearing in the state, and it would certainly be within the facts to place the apple crop at over a half million bushels.

A PROFITABLE APPLE CROP.—With such a yield as is generally reported in Minnesota and prices 40 cents to $1.00 per bushel, apple growing is being found a profitable pursuit in the year 1898. Prices will not always range this high, but in fairly suitable locations in our state, we believe the business will be found as profitable as in the "Land of the big red apple," about a visit to which Mr. Harris tells us in this number.

COMMERCIAL EXHIBITS AT THE STATE FAIR.—A very interesting feature in the Horticultural Hall is this class of exhibits. This year it was represented by only one, a nursery firm, though there is equal opportunity for others, if application is made in season. There has been already two applications for similar exhibits for 1899, and others can doubtless be accommodated if heard from in season, as it is probable the whole hall will be given over to our use without reservation. Applicants should give space wanted and outline of the proposed use of it.

THE RUSSIAN NOMENCLATURE COMMITTEE.—This joint committee from the three states of Iowa, Wisconsin and Minnesota, met at La Crosse the last of August, as announced in the Horticulturist for that month. That their purposes were successfully accomplished may be seen by reading the report of Prof. N. E. Hansen, who was appointed secretary of the committee, which appears in this issue. A subsequent report by some member of the committee will undoubtedly be made, including a good description of the best type of each group, which will make the report of practical value for every grower. The work of this committee is necessarily an incomplete one and should be followed by other similar meetings as occasion demands. This joint action carries with it recognized authority and will after a little straighten out definitely all these difficulties.

FALL PRUNING OF THE VINEYARD.

DR. M. M. FRISSELLE, EUREKA.

Vineyards located where the winters are so mild that the vines need no protection against cold, that they need not be covered in order to save them from destruction, may be pruned either in autumn or spring, at the option or convenience of the owner.

But vineyards in middle and northern Minnesota, where the vines for safety must be put under ground, necessarily must be pruned before such work can be done, as it would be impracticable to remove the vines from the wire trellis and bury the entire season's growth. If the vines were trained to stakes rather than to wire trellises, the vines might be given a preliminary pruning by which the vines could be sufficiently shortened to enable them to be readily buried, and then in the spring when the vine was again tied to the stake they could be pruned to the proper length.

As to the effect of spring or autumn pruning on the succeeding crop, other things being equal, I believe that pruning in the spring is best. In my experience with a vineyard on the shores of the Hudson during twelve years, where the vines did not require winter protection, I found that pruning in March or early April, rather than in the fall, resulted in the best crop, for the reason that in fall pruning the fruit bud nearest to the excision of the cane was liable to die for want of moisture or other cause, thus greatly diminishing the number of fruit bearing buds.

The method of double pruning when practicable would require more labor than in complete autumn pruning, but probably the extra labor would be more than paid for in a larger crop.

Mr. Harris: If the fall pruning is done immediately after the leaves fall the vines bear a good deal better. The buds through the fine days of October swell a little and are more apt to bring fruit bearing canes than if pruned later.

Mr. Dartt: Down in Iowa a few years ago I heard a prominent grape grower say that the bleeding that resulted from spring pruning was only the escape of clear water, and that it did no particular harm. He was a man who raised a great many grapes, and I always supposed the only objection to spring pruning was that the vines would bleed and be injured thereby, but he said there was no damage done by bleeding.

Dr. Frisselle: I often observed in the east that vines that were pruned in the spring, if they were not pruned pretty early, would bleed a good deal, but I never observed that the crop was damaged at all by the bleeding. I often thought it ought to damage the crop, but I never observed that the crop was injured.

F. W. Kimball

AUSTIN, MINN.
First President, So. Minn. Hort. Society.
(For biographical sketch, see index.)

THE MINNESOTA
HORTICULTURIST.

VOL. 26. NOVEMBER, 1898. No. 11.

So. Minn. Hort. Society.

A REVIEW OF THE SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

CLARENCE WEDGE, EX-SEC'Y, ALBERT LEA.

As one who has been with this society since the beginning and actively interested in promoting its welfare, I have been asked to give an outline of its conception, organization and growth to the present time, with the hope, no doubt, that it might prove an assistance and encouragement to other localities to organize similar societies.

For two years previous to the organization of the society there had been a desire expressed by a *few* people of Mower and Freeborn counties that we have an opportunity to get together and exchange experiences on the subject in which we were so deeply interested.

In the fall of 1893, we decided that it would cost little to make the attempt, and a meeting for preliminary organization was called in the rooms of the commercial club of Albert Lea, and a number of letters were written to persons who were known to take an interest in horticulture, requesting their presence. When the hour for the meeting came around and an elegant suite of rooms, lighted and heated for the occasion, were awaiting the honor of ushering into the world a new organization, just two persons showed themselves. After waiting a proper time for the earnestly expected throng without any addition to their number, the two worthies shook the dust of the city from their feet and departed to the suburbs, where in a house situated in the midst of an orchard and nursery, they "slept over the matter." In the morning with the aid of a neighbor "we three" organized the Southern Minnesota Horticultural Society, adopted a constitution, elected officers, appointed a committee on program and set the place of first meeting at Austin. (The portrait of our first president, Mr. F. W. Kimball, of Austin, appears as a frontispiece of this number.)

The Austin meeting was not a great success in point of numbers, but it developed one or two men who have taken a personal interest in the society ever since, and, as in the case of all such organizations, have constituted the real backbone of the society. The papers read were not such as would greatly enlighten advanced classes in horticulture, but they were practical and elicited discussion which was carried out with interest and profit to all. Membership was fixed at one dollar per year, and, according to the then existing rules of the state society, this entitled the holder to a copy of the paper bound reports of the state society. A membership of twenty-nine was secured, and the society safely launched.

The second annual meeting was held in Albert Lea, where through the liberality of our merchants premiums were offered for collections of apples, and by considerable advertising an attendance that filled the principal parlor of the commercial club was gathered together, and the membership increased. But the history of our society is too long to give in such detail, and we will only venture a few general observations from our experience, that may be a help to others.

By alternating our meetings between the two cities and by exciting each to do better for the society than the other, we have been able to offer free entertainment to all members, secure pleasant halls at nominal rates, and so manage the expenses of the society that we have been forehanded and able to spend the money that we had in the treasury rather than that we hoped to have. While the society was in its infancy we found it a good investment to pay the traveling expenses of prominent men to come and instruct and encourage us, but the feeling seems to prevail that now our meetings are sufficiently attractive to insure a high grade of attendance without any additional inducement. The problem which we are now trying to solve is how to bring out the lesser lights in our section and make our society fulfill its real mission of reaching the masses. Our last meeting held in Austin, when over a hundred were in attendance, was the nearest a success in this matter of all we have held, and was due entirely to personal work by the old guard before the meeting. It seems also a good plan to hold our meetings on days when the farmers are likely to be in town in full force and then *hire* a good, respectable citizen to spend his time on the streets urging those who may happen to be in town to step into the meeting for a few moments. If he proves a hustler, the farmers will pour in and many "who come to scoff will remain to pray."

There are several sections of the state that ought to have similar local societies. There is the valley of the Blue Earth river, situated in the midst of the "Wealthy" districts, with the Richardson nursery and Park's famous seedling orchard as centres of attraction. The valley of the Cottonwood river would bring together a large fraction of the plum men of our state, where Cook and Wood and Knudson and Penning could swap experiences and instruct their neighbors in the mysteries of growing Prunus Americana. And there is the Rock river and the Root river and many other localities where county societies could be easily organized and might become feeders to our state

society,and aids in developing the fruit resources of the state. These societies are not the tax upon the time of the members that many benevolent societies may be that meet every few days, and since the state society offers to receive into full membership all who belong to the local society by the payment of a share of the fee into its treasury, it is not the extra drain upon the pocket of the local promoters that it was when our society was organized. It seems to the writer that as the years go on the work of the state society should assume more of a theoretical and scientific character and that the work of communicating to the masses practical progress in horticulture should be left very largely to the farmers' institutes and local societies.

PRESIDENTS' ADDRESS AT ANNUAL MEETING (1897) S. MINN. HORT. SOCIETY.

J. C. HAWKINS, AUSTIN.

Fellow Members of The Southern Minnesota and Fillmore County Horticultural Society:

I am pleased to greet you at the close of another year's labor. The battles of 1897 have now been fought, and we meet again to talk over the incidents of the struggle, bury the dead, bind up the wounded and lay plans for the future. The work of the horticulturist is indeed a warfare. He must continually fight the weaknesses and diseases of plants, their want of adaptation to new environments, insect enemies and, more than all, the vicissitudes of our climate. These, alas! are but a few of the foes that beset his path. It would be a lengthy task to name them all; every fruit grower knows them too well. They face them at all times and in all places, year in and year out; from the planting of the seed to the marketing of the fruit, there is not a day that one or more of them does not make an assault. Either intense cold or long continued heat, sudden changes of temperature, rains, drouths, frosts, sleets, winds, thorns and thistles, weeds, worms and parasites, mildews and blights and, I will add, thieves (human and brute), railroad and express companies, commission and middle men—each and every one is watching for opportunity either to destroy or to appropriate to himself the labors of the horticulturist. Thus it is seen that in saying his work is a battle I use no figure of speech. It is real earnest, incessant warfare, from which there is no escape unless a coward gives up the contest, folds his arms and lies down to the sluggard's sleep. Action then is the mainspring of all spiritual, mental or physical growth. It is, therefore, the basis on which we as a society, must work and develop the objects for which we are banded together.

The fruit exhibit at our county fair last fall, although not large, attracted wide attention, and many were surprised that this county was able to make such an exhibit. The apples and plums were especially fine. We are proud of the position attained by the fruit growers of southern Minnesota, that we are well up the mountain

and can look over into the Canaan, the promised land, the home of fine fruits.

To all of our friends I extend the hearty welcome of this society. Not only to this but to all meetings of this society, we are glad at all times to have you with us; it shows your appreciation of our past work and gives us courage to do more in the future, and should any conclude that they like us well enough to become one of our number you will make us twice glad, and I can assure you that should you join our body you will find yourself connected with a right royal good set of fine fellows. To all I advise, ask questions. Don't leave this meeting with an unsolved difficulty not stated. Sombody here will probably answer your query, if you will only give it voice. This will increase the interest and profit of our session, and when it has closed, and each member goes his own individual way, all will realize that it was good for us to have been here.

IRRIGATION IN A SMALL WAY.

G. H. PRESCOTT, ALBERT LEA.

There are two points to be considered in irrigation; first, to get the water; second, how to apply it. I get my supply from a tubular well, two inches in diameter, 142 feet deep, twelve feet in the rock, the water rising to within twenty-seven feet of the surface, and pump it into a tank on a tower twelve feet high. A pipe 1¼ inches in diameter runs from the tank along the side of my garden. This pipe is connected by couplings, every other one being a T for a ¾-inch pipe. I use a pine plug to stop up the hole until we want to use the ¾-inch pipe. The ¾-inch pipe is used for side lines of pipe and running the same way as the rows of plants. I also have twenty feet of rubber hose, ¾-inch, and a nozzle. Now, if your cultivator is arranged right the outside hoe will make a small furrow just right to run the water in. Run the ¾-inch pipe line along the row to the highest place and attach your hose, first taking off the nozzle. Lay the hose lengthways of the furrows, and you are ready to turn on the water. When the water has run the full length of the furrow, put the hose in another furrow, and so on. If you want to spray or run a stream of water on your plants, put on the nozzle. To spray, put your forefinger on the under side of the nozzle close to the water, and you will soon learn how to make a very nice spray. Your hose will water all the rows of plants twenty feet each side of the pipe. When that is done move the pipe to the next coupling in the main line.

I use horse power to do my pumping. Blindfold the horse, and he will go right along without a driver.

I sometimes spray the raspberry and blackberry bushes when they are repining, holding the stream at the root of the plant for an instant—it acts like a shower. Evening is the best time. It is cheaper to let the water flow, as one has to hold the hose all the time while spraying.

For cucumbers and other vines, make a good furrow near the hills; the vines will run over this furrow, but you can use it just the same.

THE HOME PLUM GROVE.

J. M. UNDERWOOD, LAKE CITY.

My subject presupposes the necessity of a home for mankind at large, and it is sincerely to be hoped that it is the condition of every one here; it likewise suggests land and the ownership thereof. What independence that means! What freedom! No narrow walls to confine the limbs, or to stifle with foul air the breast of him who treads the groves of his own home and plucks from off the trees the fruitage of his own labors! Have you a home or just a place to stay in? Is it surrounded by trees to protect you from the cold of winter and to provide grateful shade in the hot days of summer? Do *you* have possession or do the hogs and cattle? Have you a well kept lawn with everything neat and tidy about you, or must you go to some more careful neighbors to find these things?

Everything, certainly, should be found around a home that can in any way contribute to its comfort and happiness, and my subject further suggests that a grove of plum trees would be a most desirable adjunct thereof. Have you a plum grove? If not, why not? Plums are easily grown, are hardy and prolific. They never have received the attention they deserve in the past, but at present much interest is being taken in growing them, both in the east and west.

There are ten or more different classes of plums under cultivation in this country and many varieties of these classes, but the class that chiefly interests us in the northwest is that known as the American type, or Prunus Americana. This class is being very much improved by hybridization, selection, and cultivation. As is the case with all fruits, the cross fertilization of different varieties brings about new and improved sorts. Where this occurs between the different classes, the result is a hybrid, which also is often an improvement on the original plant and fruit. This most interesting work of improving and selecting the best of this class of American plums is being prosecuted with great earnestness and zeal by a number of men. The foremost man in this work in Minnesota is our veteran horticulturist, O. M. Lord. Prof. Green, of the State Agricultural School, is doing very much the same work to systematically promote this branch of horticulture, and much valuable information is given in the bulletins issued by the State Experiment Station.

Having said this much to induce you to plant plums, I will now offer some suggestions on how to do so successfully. The same general rule that applies to everything that is necessary to success applies to this, viz., do your work well. I gave a friend some trees, and when I visited him he pointed with pride to them; but the poor things fairly wept as they looked at me, and I almost wept to see them, standing in the front yard in a dry, hidebound sod. I suppose he thought he was giving them the post of honor in the front yard, but how sad they looked, and how they pleaded with me to take them back home and give them good culture.

The use to which plums can be put in the home are many and varied; plum-jelly, plum-marmalade, plum-butter, plum-jam, etc., are "jam up good," but to my notion canned plums are better. With the improved varieties the skin peels or strips off easily and the varieties that are freestone or practically so are easy to pit so they are beautiful to look at, and served as sauce they rival the peach, or as a shortcake they rival the strawberry. For eating out of hand, plums are a favorite with every one, and by a judicious selection of varieties a succession of them can be had from August 1st to November 1st. The time of ripening will, of course, vary according to the soil and location. At our place the past season the Aitkin began to ripen August 1st, the Cheney August 22nd, the Desota, August 26th; the Weaver, September 1st; the Hawkeye, September 1st; the Miner, September 15th—thus covering a period of nearly three months.

As to varieties to plant, consult the list recommended by the Minnesota State Horticultural Society or the catalogues of reliable nurseries, or the new mentor that has flashed upon our horticultural horizon, called "Northern Fruits," which I am sure will be most excellent authority.

I trust that in the few thoughts that I have given I have convinced you that plums are a valuable fruit and that every one that has a place for it will plant this coming spring a plum grove for the home.

FOOTPRINTS IN THE FOREST.

C. F. GARDNER, OSAGE, IA.

Having been requested by your executive committee to write an essay bearing the above title, giving some of my observations and experience with forest trees during the last thirty-eight years on the prairie soils of northern Iowa, I shall, in complying with their request, try to confine myself to the subject and not burden you with extended remarks on the methods adopted and pursued in British Burma, Ceylon or China, or the best way to cover the sand dunes on the shores of Holland and Denmark with trees. The experience in other countries and in other latitudes, while it might be interesting to the general reader, would be of little or no value to the tree planter in Iowa or Minnesota.

The first thing impressed on my mind when I came to Iowa, was that our virgin soil, on the average prairie, in its natural condition, was totally unfitted to produce forest trees, either by planting the seeds where they were to grow or by transplanting small trees directly on the sod. This is true now; there has been no change in this respect.

We found in the process of ordinary farming that it took three years to prepare the soil so that it would be in first class condition for forest planting. The first year the land was plowed with a breaking plow. The second year a crop of small grain was grown, harvested, and the land re-plowed in the fall. The third year it was planted with some hoed crop, such as corn or potatoes, which were

harvested and the land plowed again. The spring of the fourth year we found that the ground could be prepared in excellent condition for the reception of either seeds or cuttings.

The first varieties planted were the cuttings of the cottonwood and the white willow. The former were planted in groves eight feet apart each way, each row being filled in between with black raspberry bushes, which produce good crops for several years and then die out, the ground in the meantime being thoroughly cultivated. These trees made a remarkable growth for upwards of twenty years, when they began to decline, and at twenty-eight years from the time of planting all were dead and had been cut up for stove wood. Their average height was about seventy feet and their diameter two feet from the ground was from two to three feet. Single trees set out about the same time, 1860, are still growing, and one cut down two years ago was five feet in diameter at the butt. The white willow did well for many years, until the willow worm made its appearance and converted a valuable timber tree into a disgusting nuisance.

In 1866 67 the following varieties were planted: white and black ash, butternut, black walnut, soft maple, hard maple, white and black locust, basswood, box elder, white, red and rock elm, white birch, silver-leaved maple, Lombardy poplar, balm of gilead, black birch and white oak, yellow willow, American and European larch, Kentucky coffee tree, white pine, balsam fir, red cedar and other varieties.

In 1870 the following kinds were added to the plantings: Austrian pine, Norway spruce, white spruce, arbor vitæ, Scotch pine, red pine and others.

In 1875 wild black cherry, horse chestnut, yellow and black birch hemlock, spruce and others.

Since then the following have been added: Douglassi, Black Hills spruce, Engleman, silver cedar, concolor, Picea pungens, Pinus ponderosa.

The white and black locust did well until the borers made their appearance, when we were compelled to bid those trees a sad and affectionate farewell.

Lombardy poplar grew for many years very vigorously, then died down and sent out a new growth of top. This operation has been repeated several times. They come as near being absolutely worthless as any tree I know of. The balm of gilead is but very little better. Yellow willow grew up into quite large trees in forest, but were cut down and the land cleared off before the advent of the willow worm.

On our ordinary prairie soil, the black and yellow birch will not pay for planting. The white birch on the other hand, makes a magnificent tree and succeeds everywhere.

The American horse chestnut and balsam fir are valuable ornamental trees, but never plant them in forest, as they have no value for timber.

The larch and, in fact, most varieties of trees should never be planted in large masses; they should be planted in belt not over

five rods in width and of given variety. Plant from 400 to 600 trees to the acre of valuable kinds for timber, and fill in with nurse trees, making in all about 2,722 to the acre, or four feet apart each way.

Trees planted in this way and kept well cultivated will shade the entire ground the third year, after which no more cultivation is necessary.

As soon as the nurse trees are large enough for good sized stakes, thinning out should commence. Show no mercy,but cut or grub out all trees that are encroaching too closely on those that are eventually going to occupy the whole ground as a permanent forest. This thining must be done gradually, from year to year, taking care not to cut out too much in any one place, the object to be attained being to so thin them out as to always keep the ground shaded, thus preventing the growth of grass and weeds, that would otherwise spring up but are never found in an ideal grove.

Make it a rule never to cut a tree unless it will be a benefit to your grove. Never neglect cutting out those which should be removed. This work is best done from late fall to early spring.

Many failures have resulted in the planting of such nuts as oak chestnut, walnut, hickory, etc., caused by the planter reading in books that should be standard authority that such nuts will not grow readily or at all if allowed to become thoroughly dried or cured. This conveys to the mind of the ordinary reader that the nuts may be partially dried or cured without injury to the germinating power. This is a fatal mistake. The meats of such nuts must not be dried at all or allowed to shrink, and only the surplus moisture in the outer covering or on the outer covering is to be removed by a few minutes exposure to the sun or dry air. The very best way is to prepare your ground and plant your nuts as soon as you get them. Mulch the ground over as soon as planted to prevent their being heaved out by the frost. Always plant twice as many seeds as you want to grow and when they are one year old transplan your surplus stock or destroy it with the grub hoe. This is very important and should never be neglected.

Remember that the seed of the red, or slippery, elm (Ulmus fulva) will not, like the other elms and soft maple, germinate the same season they are picked, but must be stratified as soon as gathered and may be planted that fall or the following spring.

Also remember that black ash (Fraxinus sambucifolia) will not germinate like the seeds of other ash trees the next spring after picking. They must be picked, stratified and lay over one year before they will germinate.

It is a well known fact that all seeds of conifers and such seeds as those of the white birch must be started in shaded seed beds. Time will not permit me to go into this branch of the subject.

The northern red cedar is a desirable conifer for this latitude. It makes an impenetrable windbreak and when properly taken care of grows quite rapidly and is a very valuable tree when it arrives at maturity. They should be planted by the million.

Whether it is more profitable to plant trees for the sake of their

timber and for fuel than it is to plant cereals and other crops for their food values, must be left for each individual to decide for himself.

A good writer in the Gardener's Monthly, says: "It is a great gain to forestry to note that the weak arguments for forestry, which bring the whole subject into disrepute with persons of ordinary understanding and leave the topic to be handled by visionaries, are being gradually laid aside. There are innumerable solid reasons why old forests should be judicially cared for and new ones planted without resorting to bugaboos to frighten people into what cool reason cannot sustain."

When we travel over our praires and see so many farms stark and treeless, often with a lonesome house and, perhaps, a barn also, without a single tree or shrub, for either ornament or shelter, it seems to me that it must be a self evident fact that it will be easy to convince such people that they may find actual profit as well as pleasure and comfort to themselves, their families and their domestic animals, by sheltering their crops, their gardens and orchards, and their buildings as well, from the excessive force of the winds.

The man who has the good sense and judgment to plant out a forest plantation and carefully attend to the wants of the growing trees, will as soon as he commences the thinning process take care that all dead brush is removed where it can be safely burnt, never allowing it to accumulate on the ground among the standing timber, as it would be a continuous source of danger from fire.

I would recommend the use of a sharp grub hoe in removing nurse trees, instead of the axe, thus leaving no stumps.

In closing this paper, I wish to repeat the words used by Prof. J. L. Budd, in a late issue of the Des Moines Register, in regard to the death of Judge Whiting: "The Iowa press has quite generally noted the recent death of Judge C. E. Whiting, at an advanced age, at his grand home in Monona county.

"Unitedly these notices speak of him as an able pioneer of the Hawkeye state, and that he was the democratic nominee for governor in 1885. His remarkable career as a tree planter in the way of shelter belts on the wind-swept Missouri bottom, and his success as a pioneer fruit grower in the days when people said fruits could not be grown on the prairies, have not been even referred to.

"When his brief political history is forgotten, the one thousand eight hundred acres of wind-swept prairie which he transferred by shelter belts of black walnut, around every eighty or one hundred and sixty acre tract, will live as an object lesson.

"He was the only man in the west who demonstrated on a large scale the fact that with two-fifths of the land surrounded by shelter belts, far larger aggregate crops can be grown on the remainder than on the whole when swept by the winds.

"During the last twenty years of his life he called attention to the great fact that shelter belts lessened evaporation and permitted the growing of grops that failed in open exposure. He also called attention to the fact that when the corn in western Iowa was fired his great fields escaped. When the grasshoppers came they passed

over his timber sheltered tract, when the rust played havoc with the cereals of that section his great fields escaped, and when the storm raged outside his fields had a relatively quiet air. In addition to added comfort and the certainty of crop growing, he was able to demonstrate that the growing of black walnut on rich bottom land was a money making business. During his forty years of residence on this tract he was a great teacher, by precept and example of the principles involved in making a prairie home comfortable, profitable and homelike. His memory will live as a promoter of tree planting rather than as a reviser of the Iowa code and an unsuccessful aspirant for the gubernatorial chair."

ORNAMENTAL TREES FOR STREET AND PARK.

EUGENE SECOR, IA.

This is a subject about which there may be honest difference of opinion. Our tastes and experiences differ so widely that probably few of us would select the same list of trees for ornamental planting. And, indeed, there may be some well-meaning people who are opposed to ornamenting the *roadside* with any trees whatever, thinking that they have a tendency to collect snow in the winter, and increase the mud in spring and summer. It occurs to me that this class, if one still exists may have been led to this conclusion by the willow hedges that used to be more common than at present. It is true that these hedges do collect the drifting snows and consequently increase the mud in early spring; but it may be said in defense of even so inartistic a thing as a hedge along the highway, that much discomfort is prevented in a bitter cold day, when one is traveling these wind-swept prairies, by the friendly shelter which it affords. But I came not to plead the cause of the willow hedge along the highway or, in fact, any other hedge.

It may be said further in defence of roadside planting of some sort, in answer to the objector who brings forward the drift and mud argument, that fences produce the same state of affairs, and, therefore, if we are to attain to the ideal highway in no other way than by banishing all obstructions we shall be obliged to return to the primitive prairie road, when no one complained of the windbreaks as he faced the borean realities of a Minnesota blizzard.

I shall take the ground that it pays to ornament, not only the parks and residence streets of our villages and cities, but the country roadsides as well, with the evidences of civilization, culture and comfort which trees express.

Did you ever hear of barbarous tribes ornamenting their trails by transplanting shade trees? Probably not, and yet they showed their appreciation of the usefulness and comfort of these by keeping close to the native groves. But with civilization at its best, endeavoring to cultivate *all* these rich prairie lands, it is not practical to have every man's road to town winding along or through the belts of native timber, dodging the sloughs and skirting the hills. So if the mountain will not come to Mahomet, Mahomet must go to the mountain. With our so-called superior knowledge and refinement

shall we not conquer the forces of nature, and bring to our doors the good things of God, which only need to be invited by our skill and energy?

If any further remarks were necessary to convince you that a shadeless highway is not the highest type of beauty or utility, I have only to refer you to older states and countries, where the useful and the beautiful have been wedded to an extent not fully appreciated in this new and rushing west. But we shall come to it after a while.

I take it for granted, then, that it is a commendable thing to make our farms and homes attractive by judicious planting of ornamental trees along our streets and highways as well as in our parks and private grounds.

First, as to streets and highways: If we are to adorn our streets with shade trees, *what* shall we plant? I shall recommend none that are not thoroughly acclimated or hardy. It does not pay to experiment with novelties or foreign sorts from milder climates. First and foremost among the grand trees that we need not be ashamed of is the American white elm, than which no better street tree grows, according to my judgment. Of course, I mean for this climate. It is hardy and perfectly at home here. It is long lived It is tough and not liable to be broken by wind. It is king of trees in this latitude for majestic sweep of limb, and a queen in the gracefulness of its slightly drooping branches. It softens and mellows the sunlight creeping through its scattered foliage. It sends its roots deep enough into the earth to avoid the plow in an adjoining field, and never throws out suckers or root sprouts.

Next among my favorites I would name the sugar maple, that northern tree of beautifully green foliage in summer and unsurpassed in autumnal tints, under whose clean, wormless leaves it would be a luxury to be buried if it were not a greater one to live and love such an admirable, widely distributed and useful tree.

And then there is the white ash, that when planted in isolated positions assumes a nicely rounded form, is a good grower, and the wood valuable.

I think no one will make a mistake in the selection of the three kinds named above, either for the roadside or street planting. Linden and silver maple may be added but never ought to take the place of the first three named.

I think all are natives of this state and, probably, easily obtainable. Other varieties might be named, but this list is likely large enough. *Any* tree is preferable to no trees, but it is well to plant the right kinds. It will cost just about as much to plant a measly cottonwood, or a lousy box elder, or a short-lived Lombardy, as one that will grow and expand with your children, adding strength to beauty and usefulness to age. We forget when we plant trees that generations of men may pass away while these living monuments stand to proclaim our good taste—or the lack of it.

When you ask me to speak of trees best adapted to parks, you ask me to approach a subject too large in its application for me, a mere amateur, to do justice to. At best I can offer only a few thoughts suggested by my limited experience and observations.

While our severe climate excludes many choice ornamentals found in parks further east and south, there are still left a good many which are adapted to this locality—varieties, too, if they could be called by some foreign name would be thought highly desirable.

By the way, I wonder how many years it is going to take us to learn that we have in America some of the finest botanical specimens in the world, things which we never appreciated till European gardeners came over after them, took them home, and gave us lessons in artistic effect which revealed some of the undeveloped art resources of this country. I have heard American tourists to Europe say that they had no conception of the beauty of some of our American trees and vines until seen in the old world under favorable culture and training. So I repeat that it is not necessary to go to foreign lands to obtain suitable trees, shrubs and vines for parks or for home planting. We need to look around us and utilize some of the beautiful specimens which God has adapted to our environment.

Varieties, even when hardy and desirable, should be selected with reference to size of grounds, their contour and the uses to which they are to be applied. Trees of large growth and spreading habits are permissible in parks of large extent, while they would hardly be suitable in a small lawn. When there is room to plant a variety, some should be selected for their dense foliage and complete shade, and others because of their small leaves and ability to admit sparkling bits of sunshine through their sprightly branches. As example of these types, let me mention the sugar maple and the linden as representing the former and honey locust the latter.

Among the many hardy and beautiful trees adapted to park purposes in this climate may be mentioned those recommended for street purposes and, in addition thereto, hackberry, honey locust, coffee-bean, buckeye, larch, laurel-leaf willow, European white and cut-leaf birch, caragana (pea tree), etc. All of these will be found hardy here, I think. There are many others. It will not be necessary for me to extend the list.

It is always safe and generally desirable to have in your parks all the trees of your woods. A jack oak that will thrive is far better than an catalpa that needs a fur overcoat in winter. This is also true of vines and shrubs. The Virginia creeper and bittersweet are so common in our woodlands that we do not recognize their worth as ornaments for our home grounds. And the somewhat common tree cranberry and black haw are not to be despised when making a list of ornamental shrubs.

There is one foreign shrub to which I would like to call your attention. I obtained it under the name of Russian snowball, but its blossom is more like the haw. The shrub itself is a beauty aside from the blossom. It is as hardy as a bur-oak. Its leaves are very thick, and limbs tough and leathery.

Evergreens produce such a pleasing effect, especially in winter, that we should plant every variety which promises success—the large growing kinds, like white pine, where there is room for development, and the dwarfs on small lots or in places where it is desir-

able not to obstruct the view. I think nothing pays better for the expense incurred in planting, if done in a proper manner, than putting out evergreens. They give a home-like expression to grounds which can be produced in no other way. They are a promise of genial warmth within the home wherever found.

I wish to say a word for the encouragement of the Public Improvement Society. Public parks and grounds being public property, the old saying "What is everybody's business is nobody's," always applies, and unless some tireless public spirited ones keep the matter of improvement well stirred up it is liable to languish. Some people are slow to move unless they can see the results of their efforts at once. But trees do not grow to maturity in a night. Those who labor to beautify a town are planning for the enjoyment of future generations. Blessed are they who live to partake of the fruits of their own labors, but thrice blessed are the unselfish ones who plant for posterity! May their number increase, and may they live to enjoy the fruition of their fondest æsthetic hopes in this world and immortal gardens in the world to come!

THE FARMERS' FRUIT AND HOW TO GROW IT.

F. W. KIMBALL, AUSTIN.

While the theory may be correct that it is cheaper for the farmer to buy his fruit than to raise it, it results, as a rule, in his family going without it; and only on the theory of its general absence can it be made to appear that it is cheaper to buy. As no money consideration can atone for the absence of health, I am bound to believe that the improved health of families who eat freely of fruits as ample compensation for all expenditures of money and labor in obtaining such, to say nothing of the pleasure of the palate in consuming them. That the farmer's family more than most others need the influence of fruit in their diet goes without saying, as they are compelled to use more freely of salted meats. Who does not remember the tales of death among sailors years ago resulting from scurvy? Now, who ever hears of it, since the days of canned fruits? In fact, the word itself has become almost obsolete.

I am not a horticulturist and can address you as a farmer or one raising fruit in his garden for his family only. The first fruit of the season in this latitude is the strawberry, which is easily raised, and in favorable seasons can be grown ready for picking at a cost not exceeding five cents per quart, and, I doubt not, many seasons for three cents. Select a good piece of ground well fertilized and as free from weed seed as possible, moist soil, at the same time let it be well drained ground—but any ground that will raise good corn will raise good strawberries. Ground that has been in clover is recomended. I would advise all farmers to get good staminate varieties only. Plant in long rows, six feet apart and about eighteen inches to two feet apart in the row. I wish to especially emphasize the putting of all small fruits in long rows, so they can be cultivated with the horse, as a good share of the cultivation can thus be done as cheaply as for corn or potatoes. Let your vines

develop as fast as they will, but turn the runners in so your rows will be about three feet wide, leaving a walk between rows. Early in the fall cover with a mulch of manure, and should the ground be solidily frozen you need not fear the depth. However, if it is covered with manure that is partially rotted and not at a greater depth than three or four inches, leaving no vines in sight, they need no further attention till after blossoming time, for this mulch will be so disintegrated by the winter frosts and spring rains that the vines will come freely through it. Should weeds appear, one good, thorough plucking would probably do till after picking, at which time the beds should be mown clean, and if not in vicinity of bushes or trees that would injure the old mulch can be stirred up light, and the whole burned on a day when there is a good breeze. If where they cannot be burned, use a disk harrow or cultivator and cut all out except about one foot in width at each row. Cultivate thoroughly the spaces between, and you have a good chance for a good bed for another year.

The next to come in fruit after the strawberry are the blackcap and red raspberries. To insure a good crop and safety to the bushes they should be laid down over winter, but as most of my farmer friends are inclined to think that only an expert can do it and are apt to neglect it, I would advise planting only the hardier kinds, and what those kinds are is a good subject for discussion by this meeting. Plant in long rows, mulch thoroughly and cultivate in the spring till fruit sets and commences to ripen; keep the hills down to six or eight good stalks. In the spring clip off about one-fourth to to one-third of the previous year's growth and see what an immense amount of comfort you and your family will get from a small patch of ground.

Of these small fruits put in enough so you will have all you want in a poor year, and in case it proves a good year let the children pick and sell the surplus. You will be surprised at the result.

In the proper place I should have said plant your raspberries in rows about six feet apart and about four feet apart in the row.

Do not fail to have a few hills of good gooseberries. Probably you will get more comfort out of these in a series of years than anything you plant. Feed them well and mulch them so as to keep the grass out and the roots cool, and they will yield you lots of fruit for sauce, pies or canning. The old reliable Houghton is one of the safest for this climate, though a rather small berry.

About this time your summer apples will commence to attract your attention—but I will leave this subject till later.

At this time your plums should be giving you delight, especially if you have set some of the early along with the late. Cheney and Forest Garden are probably among the best early ones, and one should not fail in having a few of these. Of the good late ones, their number is legion, and without doubt all possess merit in especial locations, but the one best adapted to all locations and all soils is probably the Desota, an inordinate bearer and ready for business every year unless cut by late spring frosts. If you wish variety you should try Rollingstone, Rockford, Wolf, Wyant, and many others could be named.

Next on the list comes grapes, one of the most delicious of fruits and with a little care easily raised. To insure the life of the vines and good fruitage they should be laid down every fall—a small job when once taken hold of. They should in the fall be trimmed to one main stalk and small side branches left long enough to take two or three buds. The vines should be set about eight feet apart in the row and the rows six to eight feet apart.

The first year set cut back in fall, leaving only one or two buds, and cover with a good mound of earth, and this mound with a good amount of mulch; in after years the earth will be sufficient. The second year allow but one strong cane to grow, and in the fall trim ready to lay down, and if you have them in quantity and in rows as suggested run a plow as near as you can, throwing the furrow away, then laying your vines in the furrow, plow another furrow throwing the dirt on the vines and finish any uncovered portions with the shovel. In this way vines can be covered at a cost not exceeding one to two cents per vine. In the spring leave them as long as is safe or until you find the buds are getting well started, as the later you can keep them covered the less danger from late spring frosts.

The Concord is, perhaps, all things considered, one of the safest to plant and a good bearer—however, to insure a crop in all seasons I would more especially recommend Worden and Moore's Early for blacks, and probably Moore's Diamond is among the best of the whites. All three of these are considerably earlier than the Concord, thus making surer of a crop. Among the white grapes I would like to commend the Niagara and Martha as excellent grapes and well worthy of a trial, and for a red do not neglect the Brighton and, probably, also, the Delaware. Green Mountain and Early Ohio are now well spoken of as fine and early grapes. These do not by any means comprise the list of good grapes, but is a sufficient list for a small garden.

Soil of good clay loam strongly slanting to the south is a favorable location. They need sun and when once bearing will stand a a good amount of fertilizing. Let me suggest that you set your vines north and south, and in planting dig the holes deep and set the roots on a slant towards the north; then the lower end of the roots will be covered much deeper and, I think, the vine can be laid down more readily.

Now we come to the king of all fruit, the apple, rightly so consid. ered because of its varied season, eating and keeping qualities Among them can be be found sweet and sour and all grades and combinations between. Unfortunately for us, few varieties of late keeping apples are as yet safe to plant in this latitude, and few varieties can be recommended of the newer sorts that are coming into notice. For early I would recommend setting a few each of Yellow Sweet, Summer Lowland and Lubsk Queen. These are all early and come and go before the Duchess, which is our standard fall apple,ripens. The Duchess you can plant freely, as it is probably as safe a tree to plant as any we have on our list. I would also plant the Minnesota crab, but would say that it is not deemed as hardy

as the Duchess and is a tardy bearer, but a persistant bearer when once it starts and a fairly good eating apple, good during September. I would say that its name is misleading, as it is a fair sized apple.

For later apples I would recommend any of the Hibernal family. I deem it one of the hardiest of apple trees, a good bearer of large sour apples, and, while but few would care to eat them out of the hand, it is an excellent cooking apple, whether for sauce, pies or jellies. Its season, as a rule, is not beyond December, though in favorable seasons with care in picking and packing it is sometimes kept much beyond that date. I would also advise all to try a few Wealthy trees, one of the finest of apples, but a tree of about second hardiness as compared with the Duchess or Hibernal, a tree that is weak in the trunk and needs especial care on that account. This apple is good in any form and about the same season as the Hibernal. I would also try a few of Patten's Greenings, a large, fine apple, good for eating or cooking, season about as Hibernal, a tree especially valuable on account of its freedom from blight, but probably not yet fully tested as to hardiness. The Anisim is coming into favorable notice and is a beautiful red apple, but small. I think the tree is quite hardy and with me is quite free from blight.

What to recommend you for a late keeping apple is hard to determine. I think, perhaps, the Repka Malenka is well worth planting, but its hardiness is as yet a matter of conjecture. It is, I think, classed about with the Wealthy. I would advise setting a few Malinda for the children or grandchildren to pick fruit from in case it lives, as it is a very tardy bearer, yet when top-worked it seems to get to bearing early. It is a late keeper and of good size and fair quality. It is quite probable that there are various late varieties that can be grown to top-working on some of our extremely hardy trees, like the Virginia crab, Hibernal or Duchess. I feel confident that out of the thousands of experiments with seedlings now going on that a late variety, or several, will be developed entirely adapted to this climate. I would advise all to confine themselves to a short list, and the list adopted by the state horticultural society is the safe one to go by.

Now in regard to planting and care of the orchard. Probably the most important thing is selection of varieties; second, selection of location, which, in my judgment, whenever possible, should be on a strong northeast or north slope, with considerable declivity of ground beyond. Any steep hillside to the north with a retentive soil is favorable, a moist soil free from standing water and a slope of ground that will not in spring and summer reflect the rays of the sun on to the trunk or branches and at the same time drink up all the moisture of the ground—with a row of trees to the west, to break the direct force of the winds, but not heavy enough growth to prevent free circulation of air. This is my ideal of a location.

When convenient, set your trees north and south, quite thickly in the row, say twelve to sixteen feet, and rows thirty to forty feet apart. Set with a strong inclination to the one o'clock sun, or if your sense of order is such that a view of trees so set upsets your nerves,

then set upright, but take the precaution when the trees begin to get size to protect them on the south with board or lath to prevent sunscald, which is so common in this climate. The reason for setting thick in the row is that they may protect one another when they have attained considerable growth. I would recommend cultivating hoed crops between the rows and mulching heavily the entire length of the rows for a width of twelve to fourteen feet with straw or strawy manure. Let this mulch be deep enough to prevent all growth of weeds for the first part of the season, at least. Some claim that this will induce blight, and I am not prepared to say it will not, but with us that will make no difference, for except for purposes of experiment I would not recommend any that were not practically exempt from blight. One of the first questions I now ask when a new variety is recommended is, does it blight? and if the answer is in the affirmative that settles it for me, though I have many that are blighting badly, purchased before I realized the importance of that fact.

I wish to urge on all the setting out of fruit, but if you neglect all others do not neglect the plums and apples. Do not rob your children of that possible heritage of looking back with pleasure to the hours and hours of happiness spent running to and sitting under the cherished tree, partaking of its health giving fruit.

THE INFLUENCE OF HORTICULTURE ON CHARACTER.

JONATHAN FREEMAN, AUSTIN.

Many of you are doubtless thinking and may consistently ask, what does Freeman know of horticulture in a practical way, as he has presented no forcible illustrations of the same at his Minnesota home? This is true, as a result of illness, and other surrounding circumstances. Yet, by reading and observation, with a previous extended practical experience, he has been enabled in some slight degree to keep in touch with the enobling art.

Knowing the practical horticultural experiences of the authors of the instructive address on "My Father's New England Orchard," and the able paper on "Planting the School Grounds," given in the past, you will doubtless excuse the temerity of the present speaker in presenting a few facts and some of his crude ideas for your consideration. To further indicate his slight acquaintance with horticulture permit him to indulge in a few personal reminiscencies which may indicate to you that he is somewhat like the darkey boy. Two dusky small boys were quarreling: one was pouring forth a torrent of vituperative epithets, while the other leaned against a fence and calmly contemplated him. When the flow of language was exhausted he said: "Are you troo?" "Yes." "You ain't got nuffin more to say?" "No." "Well, all dem t'ings what you called me, you is." Now, some of "dem t'ings" that you experienced horticulturists call yourselves, "I is."

Well do I remember in my early childhood that magnificent apple, given me from his splendid orchard by my reverend grandfather, a few days before his death; also on my father's farm, those beauti-

ful red, sweet apples for eating, baking and boiling, the delight of my mother; the paring of the same at apple bees for two rosy faced, noble girls to quarter and core, as I was and am considered an expert apple parer, having no use for modern machine apple parers and corers.

On settling in Bremer county, Iowa, near Waverly, among my immediate, continued and most highly prized friends were the brothers B. M. and N. A. Reeves, who were considered horticultural cranks of the first water in general society. At my new home I found over fifty bearing fruit trees, within a few years followed by the setting out of 125 more, with several thousand evergreens and European Larches from nursery size, a few inches, to ten feet in height. The larger ones were set out by N. A. Reeves, whose son is a prosperous nurseryman in Waverly. That farm, only less in extent, reminds me of your beautiful "Evergreen Farm," near this city, owned by Mr. Ellis.

One of the great trials of my life was the real or supposed necessity of leaving that dear home, after thirteen and a half years of hard labor, because of ill health of members of the family, for what seemed afterwards a "wild goose" trip to Florida, with all its acquired and natural beauties of a horticultural nature.

Permit me in my desultory remarks to consider horticulture in its wide significance, as including gardening in general, fruit culture, tree culture for profit and shelter, landscape gardening on our home premises, in parks and cemeteries, floriculture, frequently, necessarily trenching on agriculture at large. The subject assigned me appears on the program as "Moral Influence of Horticulture," in a letter from our secretary, "The Moral and Educational Influence of Horticulture on Society," and in my own mind as the "Influence of Horticulture on Character." Hence the field covered by the topics is wide enough for a clever man to follow in the footsteps of some of our ancestors by giving an address three hours long.

Permit me to refer to a few facts from both sacred and profane history. In the Bible among many references we find the following: "And God said, 'Behold I have given you every herb bearing seed, which is upon the face of all the earth, and every tree in the which is the fruit of a tree yielding seed; to you it shall be for meat.'" "And the Lord God planted a garden eastward in Eden, and there he put the man whom he had formed. And out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food: the tree of life also in the midst of the garden, and the tree of knowledge of good and evil." "And the Lord God took the man and put him into the garden of Eden to dress it and to keep it."

"When Jesus had spoken these words he went forth with his disciples over the brook Cedron, where was a garden into the which he entered, and his disciples. And Judas also, which betrayed him, knew the place: for Jesus oftimes resorted thither with his disciples." "In the place were he was crucified there was a garden and in the garden a new sepulcher, wherein was never man yet laid."

"In the midst of the street of it, and on either side of the river, was there the tree of life, which bore twelve manner of fruits and yielded her fruit every month, and the leaves of the tree were for the healing of the nations."

We read that the "hanging gardens" of Babylon were the wonder of the ancient world, and the sculptures of Egypt that are being discovered and excavated clearly indicate the esteem in which the art was held in that distant age.

During the best days of Rome we find that all her free citizens must either have been employed in warfare or in the culture of their fields, while their slaves were confined to the practice of all mechanic arts. The patricians, when in the country, forgot all the distinctions of rank and toiled daily in the fields like the lowest plebian.

Cincinnatus we have seen named dictator by the voice of his country while at the plow. M. Curius, after expelling Pyrrhus from Italy, retired to the possession of a small farm, which he assiduously cultivated. Scipio Africanus, also, after the conquest of Hannibal and the reduction of Carthage retired to his paternal fields and with his own hands reared and grafted his fruit trees.

Of Persia we read: "To cultivate an untilled field, to plant fruit trees, to destroy noxious animals, to bring water to a dry and barren land, were all actions beneficial to mankind and, therefore, most agreeable to the divinity, who wills perpetually the highest happiness of his creatures."

Of Italy, "After the example of the last emperors, Theodoric preferred the residence of Ravenna, where he cultivated an orchard with his own hands." Of England in the time of Charles II: "Temple in his intervals of leisure had tried many experiments in horticulture, and had proved that many delicate fruits, the natives of more favored climates, might, with the help of art, be grown on English ground."

Our own Bancroft says: The great employment of France was the tillage of land, than which no method of gain is more grateful in itself or more worthy of freemen or more happy in rendering service to the whole human race. No occupation is nearer heaven."

We must not neglect mentioning our own Washington, whose grand, noble character was as much the result of time, means, strength and thought spent in this direction as of labor performed and sacrifices made for the welfare of his country.

Also, Thomas Jefferson, who kept in complete touch with our favored art while in political life, spending his vacation and leisure hours at Monticello in gardening.

Even the eminent writers do not forget our ennobling art, as illustrated by Homer, Virgil and other poets of past times, as well as our own Bryant, Hawthorne, Emerson, Whittier, Lowell and many others not directly within the ranks of horticulturists.

Alcott says: "We associate gardens and orchards with the perfect condition of mankind. We esteem the tiller of the soil as the pattern man, the most favored of all. They yield the gains of self-respect denied to other callings. His is an occupation friendly to every virtue, the freest of all from any covetousness and debasing cares.

It is full of manly labors, while it answers most tenderly the hospitalities of friendship and the claims of home. The delight of children, the pastime of woman, the privilege of the poor man, as it is the ornament of the rich man, the praise of the scholar, the security of the citizen, it places man in the truest relations to the world in which he lives. He who is insensible to them must lack some chord in the harp of humanity, worshiping, if he worship, at some strange shrine."

I have thus rehearsed some historical facts and quotations to show how the renowned of this world have looked upon the art and science of horticulture in its broad acceptance, and also to show how highly we should esteem it because of its exaltation by our Creator and His Son, Jesus Christ.

We all know by observation and experience that the employment of our hands and minds has a vital influence upon our personality. As each person has his special idiosyncrasy or weakness as a consequence of sin, heredity or surroundings, it is his required duty at the right age and time to enforce his will power in selecting that business for life that will aid in his uplifting instead of dragging him down to uselessness in the world and his own destruction. This is true, notwithstanding another general principle, that one will make the greatest success in that employment for which he has the greatest natural aptitude.

It is far better to succeed in that which is good and right with required onerous efforts, than to fail to obtain the greatest good by easily drifting down the smooth current of our natural propensities amid the vicissitudes of life. If a youth is not led by example, influence and instruction to the employment of his body and mind in some useful and disciplinary work, it is almost a certainty that the labors of his manhood will result in a failure. There will be no more exceptions to this principle than are found in the nearly certain truths of mathematics. I am just as thoroughly assured of the beneficial or injurious effects on character by the class or kind of employment in which a person may engage. History, biography and our own memories are full of illustrations proving the truthfulness of the assertion just made. Hence, as I have before remarked, both the old and young, especially the latter, should strive to adapt their natural capacities and aptitudes to those occupations in which they can not only attain a living or competence and be in harmony with their tastes and capacities when advisable, but that shall assist in creating and strengthening all the requisites necessary to the formation of a noble, true character, resulting in a useful and beneficial life. Among such studies, I consider horticulture takes a high rank. Anything that leads us to truly study the laws of nature, which are the laws of God, with a proper spirit and a practical purpose, draws us into closer relations with our Creator, if rightly incorporated into our being.

In proportion as we see and appreciate the harmony, beauty and efficacy of nature's laws, we shall, to the same extent, continually be ennobled and advanced into nearer relations with the Creator of nature and her laws. As we approach such relations, we become

more capable of rendering our highest and best service, both to those who are near and dear to us and to all others to whom we can and will render assistance.

In harmony with nature's requirements we plant the seed, set the young tree in the soil, study the times and the seasons of stirring the soil, methods and times of applying the different kinds of fertilizers, the effects of drouth and moisture, heat and cold, pruning or non-pruning, etc., etc. We observe the tree's development, fruitage or seeding, see the benefits and pleasures resulting to mankind from the consumption of the fruit, the manifold uses of the wood and timber produced by growth, notice and enjoy the beauty added to the landscape, the provided shelter against the scorching sun, against the drying winds of summer, against the arctic and snowy blizzards of winter, the amelioration and lessening of extremes of climate.

In all these things the muscles are healthfully exercised, the lungs are expanded, the blood invigorated, the countenance beams with force and intelligence, the mind considers and studies subjects that elevate and enoble the man, the moral nature is educated, strengthened and exalted to a higher plane, if the opportunities are properly utilized.

The speaker deems it far better for the world that our experimenters and thinkers use their God-given powers along the lines already mentioned, instead of thinking, talking and writing in a learned way upon natural selection, development and evolution, protoplasm, biogenesis, the primordial germ, etc., etc.

It is wonderful how many intellectual and moral gluttons and misers there are in this world of ours. Filled to repletion themselves they will not and cannot bestow on others of their abundance in a form that can be utilized by the numerous needy and deserving of the earth. I am assured that man has been placed upon the earth, not only to develop himself physically, intellectually and morally but by all his powers to also aid his fellow beings in the same direction. I am glad to quote from our Professor Brewster as follows: "Mental, moral and æsthetical culture are essential to the development of the perfect flower and fruitage of true character. The ideal horticulturist must not only have both,—the practical to make him successful in the perplexities and labors of his calling, and the personal culture to develop his moral character—but he must place upon each its due consideration at the proper time. When he buys his land, fertilizes his soil, selects his seed, plants his fields, cultivates his ground, trains his vines, prunes his trees, kills his weeds, harvests his crops, he must be geologist, a chemist a physicist and a botanist, as well as a horticulturist. But in and through it all he should remember that his every success in raising and selling his crops is not an end but a means to an end. He is deeply conscious of this truth, and every day of his life bears witness of the fact. His every plan is made, not as a temporary means, but as a factor in some permanent end. His highest ambition is to be thorough in all his plans, successful in all his efforts, faithful to all his duties and grateful for all his blessings."

My dear friends, the ideal implies the attainable, and if the horti-

culturist, among all men, is not making the nearest approach to this ideal, then he is sadly failing in fulfilling the possibilities for which God created him.

THE BEST VARIETIES FOR TOP-WORKING.

J. S. HARRIS, LA CRESCENT.

(Read Dec. 1897.)

It is not good economy to grow poor varieties of fruit of any species or any short of the best, either for home use or market, wherever better can possibly be grown. The general condition of apple orchards in Minnesota and throughout a considerable portion of the upper Mississippi valley, has been in the past and still is anything but satisfactory. In fact, the most sanguine of us have been compelled to admit that the outlook has not been very promising. Perhaps there is no other country in the civilized world, unless it is Russia, in which apple culture has had so many drawbacks and where the trees, as a rule, are so short-lived as they are with us; and the fact that just now apples are so plenty that they command but from one to two dollars a barrel is no evidence that conditions are improving, for they are not home grown or many of them from localities near by, but are far fetched from what are considered more favored fruit regions. Again, they are still too dear for the times, and none but the wealthy can afford to buy them in needed quantities. It is very true, that in some sections of this state last season there was seemingly an over production of one single variety, the Duchess of Oldenburg, which, together with inability of consumers to purchase for a short time, had a tendency to demoralize the market, but there was not fruit enough produced within the borders of the state to furnish one-tenth of the quantity needed for consumption or a supply to furnish all the wants of our people, and had the crop been three millions of bushels more, and properly distributed through the season, at prices to suit the times, there would have been no surplus to lose. Even with the exceptionally large crop of Duchess, andthe low prices and limited demand at a net price of fifteen cents a bushel, they were more profitable than most other farm crops; and all other varieties, or those coming later, brought better prices and were in better demand. If enough of them can be produced to make up the difference between supply and actual want that are now brought in from other states, it would save at least many hundreds of thousands of dollars annually.

There are some people who do not believe that we can overcome the difficulties that are in the way of producing varieties that will cover the whole season, because our winters are frequently so severe as to winter-kill about all varieties except the Duchess, and some varieties of the Siberian species, outright or injure them to such an extent that it requires a number of years to recuperate. Meanwhile a droughty fall or extra winter cold snap may repeat the mischief and give another back-set and final collapse. The fruit produced by such enfeebled trees is liable to be meager in quantity, small in size and poor in quality. I am not one of those who believe that the situation is hopeless, but I do and always have

believed that I saw a brighter side to the question. I believe that apple culture in Minnesota is destined to have a great future, that the time is coming and is even now near at hand when we shall have a pomology unrivalled in the world, varieties of the finest quality, covering the whole year, so hardy that they will endure our climate and produce an abundance of fruit for all purposes.

We have three distinct types of the apple in cultivation. The one that has been the longest in cultivation, is most largely planted throughout all the United States and produces the greater portion of the fruit of commerce, is descended from the common apple of western Europe. It possesses the finest flavored varieties and the longest keepers, but the trees of the most of the list of varieties have faults that render them unadapted or uncertain for growing in any part of this state. Their tendency is to prolong growth too late in the season to permit of a thorough ripening of the wood of the season's growth before the advent of cold weather, and thus renders them liable to rupture of bark and sap cells by the action of frost. It is this that causes what is popularly known as "black heart," a disease from which no tree can fully recover.

Another type is the Siberian species, generally known as crabs. The Siberian crab is hardy, matures its growth early and does not winter-kill, but many of the sorts are liable to attacks of fire blight in summer to a greater extent than the common American apple, and, besides, the fruit is smaller, more perishable and of a quality that can never hold it in square competition with the common apple. This species has shown itself susceptible of wonderful improvement through being crossed, or amalgamated, with the common apple, and at the present time there are hundreds of varieties that are supposed to be hybrids, and many of them are most wonderfully improved in size and quality; also their season is considerably lengthened; while a number of them appear to retain the hardiness of the crab with its propensity to blight.

The third type is comprised of the recent introductions from Russia, of more than 400 varieties, within the last twenty-five or thirty years. These sorts are proving variable in hardiness. Some are as hardy as crabs. The great majority of them ripen their growths early and will endure greater extremes of cold than our American sorts. But many of them are predisposed to blight, others have so far proved shy bearers, and again the fruit of some of the hardiest is not up to American ideas in quality, and a considerable proportion of them are summer and autumn varieties.

Now, I believe that the coming apple for this state is to be a cross breed, or an amalgamation, of these types before mentioned, to be brought about by systematic cross-breeding or by hybridizing. Nature has been carrying on the work for some time and has received some aid from the venerable Peter M. Gideon and others, with very encouraging results, as is evidenced by the beautiful collection of seedlings grown by Mr. Lightly, of this county (Mower), last season. More scientific methods are now being employed at many of our experiment stations than in the past, and good results are already being realized. but it may require considerable time for

the full solution of the question. In the meantime, we realize that we live in a fast age, and we must have more and better fruit. It is very probable, if not absolutely certain, that we can realize very satisfactory results in growing winter apples and many others of the best American sorts, by the process of top-working them upon the stems and tops of perfectly hardy congenial stocks of Russians and crabs or their hybrids that have been originally grown as root-grafts, care being taken to select only such as are not predisposed to blight; but to be doubly sure we should also have hardy roots. The hardy roots may be secured by growing them from select seed of the hardiest and most vigorous Russians and some varieties of Siberian hybrids that are inclined to throw out strong roots of their own, no matter what root they are grafted upon. With such trees we shall have hardy roots and thus obviate root-killing and hardy trunks, thus avoiding sunscald, bark-burst and black heart in the body, and by means of the modifying influence of the early maturing of the roots and body upon the top, we shall get earlier and more perfect ripening of the top wood and a proportionally greater power of resistance to the extremes of our climate. Varieties can be grown with comparative safety when worked on the tops of such trees that cannot with any certainty be grown by any system of root-grafting, either whole or piece root, or by budding or grafting upon common seedlings. It is unfortunate that thorough and systematic experiments have not heretofore been made along this line and the matter established as a science. It is my opinion that the first and most important work that should be done in our experiment stations is along this line, so that every man who desired to grow any certain variety of our best apples could know just upon what stock and root it should be grafted to insure the best success.

As far as I have observed, the Duchess, Tetofsky, Hibernal, Antonovka, Virginia, Shields, Orange, Early Strawberry and Transcendent crabs, and others, are good stocks for a great number of varieties, but it is not likely that any one of them is adapted to all varieties. As far as I have observed the Hibernal apple and the Virginia crab proves congenial to more varieties than most of the others named. Among the varieties that I consider safer and better top-worked than as root-grafts are Wealthy, Utter, McMahon, White, Soiree, Fameuse, Malinda, Scott's Winter, Ben Davis, Patten's Greening, Seek-no-further, Grimes' Golden, Longfield, Jonathan, and Tallman's Sweet. Some of these varieties named and many others are rarely injured in the tops, but are weak in root, trunk or the axils of the branches, and by being thus worked become sound and fruitful trees.

In many instances the character of the fruit is slightly changed' being larger and fairer, and probably the season may be changed slightly. These changes will be most perceptible where the stock is not entirely congenial. In a few instances I have seen the flavor influenced by the stock upon which the variety is worked, but they are rare and generally where the stock is an acrid crab. Top-working seems to be the most feasible method for growing apples until

the "coming apple" comes. It is not likely that many of our farmers outside of our horticultural society will adopt it for some time to come, but will wait for the coming apple to get here, and in the meantime our state will continue to be used as a dumping ground for the surplus stock of the nurseries of the east and south, and our farmers will plant ironclad northern grown trees from Alabama, and budded trees and whole root trees, or any other new fangled thing that sharpers can invent, supporting frauds and sending their money out of the state, until they can get a dollar to spare to join some live horticultual society. Long years hence they may hear of Gideon and the Wealthy apple and a thousand other good things that have been brought out by patient, self-sacrificing horticulturists, but the day of opportunity has passed.

GOOD, BAD AND INDIFFERENT FRUIT TREE AGENTS.

R. PARKHILL, CHATFIELD.

Blessings on the good fruit tree agent! His mission is to bring joy and gladness to the young and health and happiness to the young and old. He proclaims the gospel of an abundant supply of home grown fruit; refreshing fruit when the hot winds of summer wilt all animal creation; ripe, yellow fruit for the golden days of autumn; cellars filled with fruit in can and barrel for the long winter evenings when, sometimes, king frost compels the mercury to crawl into its den; tables groaning under bountiful supplies of small fruits and large fruits from January to December; fruit for the owner of hundreds of broad acres, and fruit for the man in the crowded city who measures his garden spot by square feet.

Battling with and overcoming ignorance and prejudice, the friend of mankind has truly a noble mission. Not to him belongs the comparatively insignificant task of making a few extra blades of grass to grow in our pastures but the grand work of making orchards to spring up where not even a solitary fruit bud was to be seen, and thus making it possible for every man to retain at least a little corner of paradise. Indifference must also be met and conquered by enthusiasm in this work, and so this preacher of truth, this grand reformer, swings numbers in line under the banner of "Fruit for the Home." But the battle rages fiercely, and the victory is only won by a hard struggle. Ignorance, prejudice and indifference are not the only foes to be conquered. There is discouragement arising from loss by the thousand and one plagues that fruit is subject to, including the ghost of the much dreaded scale.

Last, but infinitely greater than all those other obstacles in this grand reform, is the bad fruit-tree agent. He is a giant in the land. His scythe is long and keen, and he cuts a wide swath. Ignorance and prejudice oppose not his onward march, but rather aid in his dreadful work, and even indifference and discouragement quickly yield to his gaudy chromos and lying eloquence. Remorseless as death, old and young, rich and poor, all are numbered among his victims. He leaves desolation and ruin in his track, but he sweeps

on triumphantly, intent only on gathering in the harvest of gold yielded by innocent victims to this hydra-headed monster.

And so we are brought face to face with the practical part of this brief talk—what can you and I do about it? What can we do to protect the good fruit-tree agent and the victim of the bad agent? What can we do to enlighten the dark corners of ignorance and dispel the mists of prejudice?

Shall we try to shut out the "giant" by barb wire fence legislation? Vain attempt! He will crawl through or climb over any fence we can ever hope to build, or he will get a "Fruit for the Home" banner and pretending to belong to the army of good agents, gain admission at the gates. Shall we declare war on him? Surely not. This "giant" has such an immense brazen-clad cheek that the latest improved Maxin gun would have no effect on him.

What then can we do about it? Not as a solution of this most difficult problem, but simply to bring it before our meeting for discussion, the following suggestions are offered:

Starve the "giant" out by educating our people in horticulture so that he and his allies, ignorance and prejudice, will find no field to work in; teach horticulture in our schools; preach it in our farmers' institutes; have our horticultural societies' fruit lists published in a few of the principal weeklies of the state; elect men to our legislature that realize our necessities and opportunities. A few thousand dollars annually spent by our state in this great work would do a vast amount of good, and soon the North Star State would not only have abundance of fruit for the home but also have a goodly supply for export. Success to the *good* fruit tree agent!

TREATMENT FOR BLIGHT.—This trouble is due to bacterial disease, the germs of which enter the tree through the flower or breaks in the bark. The young inner bark and the cambium layer are most seriously affected. Situated beneath the bark, it is impossible to check the trouble by spraying. When any particular part becomes affected, as indicated by the blackened leaves, cut off some distance below the injury and burn. Thorough work should be done after the growing period. This is by no means a sure preventive, but it is about the only methed of checking the disease.

In a succulent, rapidly growing tree the blight bacteria find more favorable conditions of growth than in one which develops more slowly and vigorously. The Cornell station holds that for this reason too much nitrogenous manure is dangerous. A succulent growth induced by severe pruning should be avoided. Experiments have proved that withholding water from potted trees has checked the progress of the disease. In addition to apple trees, this blight attacks the pear, quince, mountain ash, service berry and several species of hawthorn.—*O. J. Farmer.*

TOP-WORKING FROM THE FARMER'S STANDPOINT.

J. C. HAWKINS, AUSTIN.

I have been asked to give my views on top-working an orchard from a farmer's standpoint. I am not expecting you all to agree with me. While I am always willing to listen to all who differ from me, I shall always claim the right to do my own thinking, and I advise you all to do the same. But before you take my advice, let me warn you that this is what constitutes a genuine crank and top-working howler.

These crazy cranks were the first that had the impudence to question the prescriptions of the horticultural doctors when they told the farmer to plant this seedling and that seedling, this and that variety, whole root, piece root, everything it was possible to swallow and not die of strangulation. We have the experience and practical demonstrations of such orchardists as Philips, Wilcox, Gaylord and others, and they still have the cheek to tell us that we must swallow these nostrums or surely die a horticultural death. While I believe our nurserymen should propagate and investigate and do all that is possible to produce the coming long-keeping apple, yet this is not a work that would be practical for the farmer to undertake. We have had the Russian craze for years, and what has the Russian given us in the way of a winter apple of long keeping qualities? With perhaps one or two exceptions, practically nothing. It appears to me that the farmers need some good summer and fall apples that come early into bearing, and we have got them. Then he needs winter apples of good quality and long keeping. And right here occurs a blank, a great open void the coming apple has to fill. We have a few apples and crabs that are perfectly hardy—you all know them. I would plant largely of Virginia crab, and two or three of the best Russians for top-working. Commence the work after three years' growth in the orchard row; top-work one-half of the top of each tree one season, the other half the next season, with such varieties as suit the taste and that would be suited to the conditions and locality. In my own immediate vicinity I would set grafts of Malinda, Ben Davis, Seek-no-further—an dmany other good apples can be profitably grafted on the Virginia crab. My orchard is young, three, four and five years planted. I have Malinda grafted on Duchess, Hibernal and Transcendent, making a fine growth, and the union appears to be perfect; Wealthy and Duchess on Hibernal and Transcendent, that seems to be perfect in every way: Wolf River on Duchess is doing well.

I would distribute the varieties promiscuously through each group of the blooming period, early, middle, and late. I am not a botanist or pomologist, yet I see and recognize the following facts: Years ago I observed, for instance, that isolated trees of the Wild Goose plum, then one of the most common of the native sorts, almost without exception remained barren, while trees standing near other varieties or, perhaps, near cherries or peaches, bore heavy crops. Investigation led to the discovery of the fact that the pollen of the Wild Goose blossom is incapable of fertilizing its own pis-

til. In other words, the Wild Goose, in order to be made to bear fruit, must have the co-operation of pollen from other sources besides Wild Goose blossoms. I remember very distinctly another object lesson along this line that I received when a young man. My wife's father was a crank on budding all kinds of fruit. At the time he bought his farm (some twenty years before I knew him), there was a young orchard on the farm just coming into bearing, and he began to bud. He could not pass the orchard but out would come the knife, a bud here and a bud there, early and late, a perfect jumble of mixtures. The results were that when other orchards in that neighborhood bore a fair crop, it would be remarked by people in general that "Uncle John's" orchard was propped up, carrying an enormous crop of the finest apples in the township; and when other orchards failed of a crop, "Uncle John" always had some and to spare.

More recently Prof. Wait, of the Department of Agriculture, and Prof. Beach, of the New York State Experiment Station, have extended this investigation to pears and apples respectively. The indications are that we will find similar occurrences among apples. Prof. Craig, of the Experimental Farm at Ottawa, in an address on "The Blooming Period of Fruit Trees," reported that he had begun experimenting with the apple in the same way that Prof. Wait had experimented with the pear.

The cause of unfruitfulness of orchards has been a frequent subject of discussion and of widely differing opinions. One grower proposes to cure it by root-pruning, another by top-pruning, one by stimulating growth with manure, another by seeding orchards down to check the growth, another by spraying; still another crank, a venerable doctor of horticulture, is astride of a bucksaw and proposes to girdle the trees. One thing seems to be well established, namely, that orchards of intermingled varieties are more fruitful than orchards with the varieties separate. But the grower must know what varieties to plant together, so that one can furnish pollen for another. Prof. Craig places apples in three groups: the first group, that of earliest bloomers, embraces Duchess, Fameuse, McIntosh Red and Ben Davis; the middle group embraces Baldwin, Golden Russett, Wealthy, Wagner, Yellow Transparent and Red Astrachan; and the third or last group, Alexander, Maiden's Blush, Northern Spy, Ribston Pippin, Roxbury Russett and Talman Sweet. Of course, the wise fruit grower will try to plant varieties together that belong to the same group, or, in other words, bloom nearly as possible at the same time. For orchards planted without regard to this provision of fertilization, we may top-graft part of the trees or keep bees, or both. I think that bees are of decided benefit.

It is said that the boy is father to the man. It is equally true of the orchard; in season and out of season the man must be father to the orchard. What would you say of the man who, in the spring, would take a pig, for instance, drop it in the hog lot, with a parting kick, leave it to "root pig or die," then return in the fall and expect to find five hundred pounds of first class pork all ready to be salted down in the barrel? It would be a grand success as a failure. So

will it be if you expect to raise fruit without care and strict attention. That we farmers generally are in need of more information on fruit growing is not to be doubted. The great mistake is that farmers commonly turn to the wrong source for information, namely, to the "tree agent." This class of people consists largely of young men without the least practical experience in fruit growing and instructed to push and boom certain lines or varieties, mostly high-priced novelties. As a result of their misleading talk, the farmer fills his yards and orchards with trees and plants for which he pays a high price, and which, without being of much value themselves take the place which other more common and really good trees and plants ought to occupy. People thus become disgusted with fruit growing and, far from acquiring reliable information, are misled and directed far away from the truth. Other farmers turn to the nurserymen's catalogues for their information, and in many instances fare just as badly. Some reforms in both directions are needed, and the nurserymen will have to accept them sooner or later, the sooner they do it the better for them. If there is much increase in antagonism between nurserymen and the public, the latter will not be the worst sufferers. Fortunately there is a strong element—and I believe this element to be in the majority—among the nurserymen, who are in full sympathy with a more liberal policy. To do the most good, nurserymen should have and deserve the implicit confidence of the public. Thus far there is more distrust than confidence, and only a small majority of the nurserymen possess this invaluable gift, and I know that those who do possess it also deserve it.

Now, my friends, I want to ask your kind indulgence while I talk a few minutes about cranks. I am a crank but before I was willing to plead guilty to the crime I took a little time to examine the history of some of my more illustrious predecessors, and I find that the cranks of one age, as a rule, have been the conceded reformers of the next. Christ was the greatest crank of His day, and they nailed Him to the cross and crucified Him. Yet the calamity He foretold has left His people without a city or a home for the last 1800 years. Galileo was a crank, and the good old mother church imprisoned him because he said this world of ours took an annual trip of about 570,000,000 miles around the sun, and revolved around its own center every twenty-four hours. They said that will never do, it will spoil all of our theology; because Heaven is above, and What-you-call-it is down below, and if the earth turns every twenty-four hours that will raise What-you-call-it every day. But owing to Galileo's great aversion to the christianizing implements of that day, he took it all back, and they turned him loose. But he whispered to a friend as he left the prison door, "The world still moves." And my sincere prayer is that it may continue to move, until it shall raise eternal What-you-call-it with every old calamity apple howler in the country, until he shall become a successful fruit grower and top-worked-orchard crank.

A PLEA FOR THE BEAUTIFUL IN HORTICULTURE.

MRS. E. B. CRANE, AUSTIN.

It is expected that any one who undertakes to address this organization shall be able to offer some opinion or thought that may instruct the members individually or collectively on the subject of horticulture, and that they may be benefited by the suggestions.

I have often wondered how a political speaker, canvassing the state for votes, who has no knowledge of agriculture more than to pay for a landscape gardener or a foreman to manage his affairs, how he can speak to crowds of agriculturists, each of whom knows more about the work than he does himself. Yet he is able to interest the people and roll off words of knowledge to them as though he had actual experience and his whole life had been devoted to the cause.

I am no horticulturist, my experience in this progressive work is very limited, but I am urged to say something to you and, though I am not canvassing for office, and do not expect applause or be solicited to have my efforts printed in the daily papers, I am willing to add my mite to help promote the good work of beautifying and improving our homes and grounds and gardens. I would like to emphasize the thought that we must accept opportunities as they come to us. If we are not able to praise the highest point to be attained, we can at least do something to show that the world and its best interests move, and that we are not willing to be left behind in this active, progressive work.

It is our duty to find delight and pleasure in life in all things around us, to be contented and make others happy; not to live without making a continual advancement towards better strivings, and to accept the best things for our happiness and to transmit to others our contentment of mind. We were talking with a friend the other day, who is now living in one of our large cities, whose work calls her up before light in the morning, and when she returns at night weary and tired she must climb a long flight of stairs to her room. She says she often retires very much wearied, but she added: "I put back my curtains and enjoy the rest so, because I see the stars when I go to sleep, and the bright stars greet me in the morning."

I often think that grounds laid out in prescribed angles with regular lines of trees and shrubs and bordered beds fail to give as much real pleasure as grounds where less order prevails. The children enjoy the woods, the brooks and the rolling lands, because they are restful and natural. So do we older people, and though it would not be best to build our homes in such places, we may enjoy a modified form of nature cared for by careful hands.

One day several years ago, our children were entertaining a number of their young associates in our yard, and they were very happy playing their outdoor games, swinging in the deep shade of trees, and rolling and rollicking over the lawn. The father of one of the girls came in his carriage to take her home, as the party ended, and he looked under the trees rich in their deep foliage and

shade, noticing the rough trimming of the branches, the bushes in the garden and the suspicion of weeds here and there, and he remarked: "You really need a gardener in this yard all the time." Seeing I did not enthusiastically appreciate his uncomplimentary remark, he hastened to add "but nature has done a great deal for your place," and I suppose he stroked his satisfied self as he rode away contrasting our home with his own, around which was an iron fence painted green and in the pattern of the "weeping willow." He failed to see the restful beauty of the deep shade, of the variety of the trees, the rolling stretch of the lawn, the rank profusion of the flowers—even the out-door games and comforts that had so delighted the children, escaped his notice. He simply took a critic's place for his standard in life and overlooked the beam in his own eye.

When this city was in its infancy, with less than forty families, one of our minister's wives conceived the idea of beautifying the town and educating its few ladies in the pleasure of floriculture. She sent for a quantity of potted plants and distributed them among the ladies to be cared for until the autumn, then they gathered together, and a floricultural fair and sale was held. This fair was one of several held by the ladies, the result of which is now our Austin circulating library. Not alone was the library the fruit of this beautiful work. It instituted in the hearts and lives of those ladies the love of flowers. It lightened the lonely lives of the pioneers and helped to make their privations more endurable, and today you can scarcely find a home where these influences reached but the inmates refer with pleasure to those early times, and the many blessings resulting from the refining influence of this early lesson in floriculture.

The pioneer who first settled on the plain where I now live was a Baptist minister, from New England. He was particularly fond of a dish of cooked greens and sent to his old home for seeds and planted them. About the same time a brother of mine, one of our early settlers here, planted and cultivated in his garden some dandelions, the seed being sent him from his native state, because he's too, enjoyed his dish of greens, and now the curled dock and bright dandelion, though they may be public nuisances by their prolific increase, yet show how seed sown and cared for in season can bring fourth many fold.

If you have shrubs to plant and seed to sow, even though the place and condition are not in strict accordance with the present ideas of this organization, do not hesitate to accept the best offered you, but plant, sow.

I am reminded of the notion that a hedge of sweet peas should lie north and south, and because I was obliged to plant mine east and west, several ladies sought to comfort me by discouraging me in my attempt. I wish to boast of the fine results of my east and west hedge. It was so luxuriant, and covered in bloom, its sweet odors were wafted over the lawn from early summer till the frosts came. A neighbor's child after filling its hands one morning with the rich blossoms to take home, asked his mother why God did not

make such pretty flowers bloom in their garden? Why should God make all the flowers bloom in Mrs. Crane's yard? The mother replied, "If you plant the seed, God will give you all the flowers you want."

Encourage your children to beautify your homes, to be in close fellowship with nature, with all that is good and beautiful and true. No influence is more refining or impression more lasting. "The mystery of the feeding root, the structure of the breathing leaf, the delicate tint of the bursting bud, the perfume of the fragrant blossom, the forming of the healthful fruit, its luscious maturity, are subject of deepest thought to them."

The memory of a childhood home where fruits and flowers abound will always be fresh in the minds as the years roll by. The busy person, full of cares and burdened with repairs and responsibilities, finds a rest and satisfaction in recurring to his childish efforts at planting trees or shrubs, and when he makes his yearly visit to the old homestead, he truly enjoys the fruits of his early labors, for he did the best he could, and the results are a pleasure to him now. It is recorded that Thomas Jefferson sat down one day and made a list of things he had done which seemed to him to be valuable to his country. He noted among other things the establishment of a church, his attempt toward the abolition of slavery or against the importation of slaves, that he had written the Declaration of Independence, and side by side with these, as if entitled to equal credit and equal honor, he mentioned the fact that he had introduced two plants into the American nation, and he said that the man who had introduced a new plant for cultivation did the greatest service to this country.

Whittier says:—

"Give fools their gold, and knaves their power,
Let fortunes bubble, rise and fall,
Who sows a field or plants a flower
Or plants a tree is more than all.

"For he who blesses most is blessed,
And God and man shall own his worth.
Who toils to leave as his bequest
An added beauty to the earth."

THE BLACKBERRY.

JENS A. JENSEN, ROSE CREEK.

For a blackberry patch the ground should be in good condition. Lay out your ground with a corn marker; plant one row of potatoes and one of blackberries; plant four feet apart in the row. I prefer rows running north and south. Cultivate and keep free from weeds. About middle of July mulch well with straw and loose litter. When the canes are two feet high pinch off the leaders. The second spring throw the mulch out of the space between the rows and cultivate a strip three or four feet wide early in the season; later mulch again. When the new canes has grown three feet, pinch off the top blackberry, which should not be allowed to grow over three feet. The third spring cut out the old canes; cut off all dead points. This is best done with pruning shears. All suckers outside the row should be treated like weeds. In this way I have raised a good crop, and I have also failed. I bought mine for Ancient Briton.

THE NATIVE PLUM.

DEWAIN COOK, WINDOM.

The native plum I consider one of our most profitable fruits either for home use or the market.

There are several groups of native plums, the Americana, Hortulana and Chickasaw, but I recommend nothing but the Americana varieties, to which class the Desota, Wolf and all of our northern plums belong. Among these we do not have to search for hardy varieties, as with very few exceptions they are all perfectly hardy. And for eating purposes what plums of any other class excel the Ocheeda, Rollingstone, Mankato, Rockford?—even the Wyant and some others are considered elegant. Our selected natives will sell in any market at from one dollar to two dollars per bushel.

While of much better eating quality, our native plums have not the keeping quality of some of the apples, and to prolong the season of fresh plums we must depend largely upon growing the earliest and the latest varieties. We have reached our limit as to late varieties, at least in the western part of the state, as the fruit ripens some two weeks later there than in that part next to the Mississippi river. The Hawkeye and Speer are late varieties and are liable to have fruit frozen in short seasons, the VanDeman is a fine plum and still later in ripening its fruit. I think it will be valuable near the east line of our state.

As to early varieties we have had the Forest Garden and the Cheney, but with the valuable new varieties now coming on I don't think we have any use for either of them. While I am not prepared to say which is the best extra early plum, I will mention a few varieties that it will be well for our horticultural friends to keep track of.

The Wood plum is well tested here; season and size same as the Cheney and of a little better quality for eating; is a good keeper; an annual and heavy bearer. Dr. Dennis, of Iowa, says that this is the best plum he has seen from Minnesota. Sprouts of this variety may be had of Mr. Joseph Wood, of Windom, Minn.

The Mankato is another favorite variety. It ripens at my place a little ahead of the Cheney, is larger than the Forest Garden and is one of the finest eating plums grown.

The Itasca is a very large plum, in quality about like the Desota and ripens among the earliest. I predict that this plum will take a place among our standards.

The above named three varieties are all natives of Minnesota.

The Odegaard is another variety that will probably prove of great value, having been grown a number of years on the university grounds at Brookings, South Dakota. The tree is a great grower while young; fruit of large size and good quality and ripens some two weeks earlier than the Cheney. Prof. N. E. Hanson says, "if you have the Odegaard you have a good thing."

The Compass Hybrid sand cherry plum, originated by H. Knudson, of Springfield, Minn., is bound to attract considerable attention, and if the fruit ripens ahead of our hitherto earliest varieties I predict a briliant future for it.

For medium season and main crop, I consider the Wyant, Desota and Wolf my most profitable varieties, and I recommend them for general planting all over southern Minnesota. The Wyant is not as well known in this section as is the Desota, but it may prove one of the most valuable medium season plums we have got.

I prefer to set a two-year old tree to one that is older–even a one-year old tree that is three or more feet high is good enough for me. The ground should be very rich and trees kept well cultivated, but good results may be obtained by cultivating only until they get to bearing well and then keeping them well mulched with stable manure. The distance apart to grow the trees is not so very material. Varieties differ in habits of growth. I usually set them in rows that are sixteen to twenty feet apart and from six to eight feet in the rows. The varieties I have recommended for general planting are all perfect flowering varieties, and as far as my observations goes isolated trees bear as well as where they are mixed with other sorts.

Do not buy your trees from nurseries located any further south than northern Iowa, as you are very apt to get trees worked upon Marianna stock, which is not hardy, and your trees are pretty sure to root-kill some winter. Besides, our northern plums are not as productive grafted on Marianna stocks.

To those who think that our wild plums don't amount to much anyhow, I will say that all the horticultural awards made at the World's Fair to Minnesota individuals was given to these same wild plums, and if any Minnesota individual received any awards on apples or other fruit, it has been kept a profound secret.

MY HOME GARDEN.

MRS. N. S. GORDON, AUSTIN.

Gardening is as old as history, for did not an all-wise Creator plant the garden of Eden for the home of our first parents? Amply was it supplied with fruit and flowers in the greatest possible abundance and profusion, giving succeeding generations, even down to this great nineteenth century, an example to follow. As a fact, wherever civilization is found, gardening early receives attention, but high art is only attainable when wealth and refinement are fairly established.

My subject naturally divides itself into three distinct, though very closely related heads, for to my mind a home garden must consist of vegetables, small fruits and flowers to make it complete and well worth the effort of care.

Select your seeds early, buy from a reliable house, and disappointments will be few. Be sure you order all the varieties you want at first to avoid delays when seeding time comes. Then fit the ground, which must be amply enriched and properly prepared to receive the seed. Leave no idle spots anywhere, for they will be a sure harbor for weeds.

To me the problem of getting everything in its place has been a hard one. Indeed, my currant bushes might tell a woeful tale of

their repeated moves, thus blighting fair prospects of fruit bearing. Lack of experience is the principal trouble, for with a small plat of ground one can hardly exercise forethought enough in the arrangement. For example, such plants as strawberries and asparagus must be planted so as not to interfere with the annual plowing and fitting of the rest of the garden, and yet should be conveniently located and at the same time look well; for let us not forget that even in a home garden, "A thing of beauty is a joy forever." Plant the latest growing varieties so the view from the walks will not be obstructed, and the plants requiring shade in a sheltered spot. Vegetables, like celery, which require more water than others, put where time can be saved in watering, especially when one is not better equipped for it than amateur gardeners are generally. In short, plan to have things handy and easily taken care of. Utilize every corner, and make your ground, as far as possible, produce more than one crop each season, for after lettuce and radishes, cabbages and tomatoes may be transplanted on the same ground. I have sometimes taken out a few seeds when I pull radishes for dinner, and put them in as I take out the others, thereby losing no time at all. As a time saver, plant the vegetables you like best and use oftenest nearest the kitchen door. The small fruit section of your garden is more of a fixture and should be laid out even more skillfully and artistically, for it comes to stay. Plant on a line running exactly each way three feet apart. This makes cultivation with a horse possible. Leave a walk between the vegetables and fruit so the horse can turn without stepping on anything.

Last comes the be auty and ornament of my garden, and flowers are planted in just that profusion which time and space warrant. A pretty way to hide the view of the other sections is to arrange a trellis of woven wire for sweet peas or flowering vines to cover. Or plant a hedgerow of hollyhocks or some tall flowering plant to separate the practical from the beautiful. My idea of arrangement in a flower garden is in solid variety, each in its own bed, bordered if you like, with a low kind of harmonizing color. But individual taste must dictate here, of course.

All this is accomplished not without some expense and a good deal of real hard work, but the saving when all is garnered in is, indeed, hard to estimate from a financial standpoint and harder still from the real satisfaction which comes of having fresh flowers, fruits and vegetables for our table. Health is an item of no mean importance, and it is a conceded fact that a home garden is an "ounce of prevention" many a time. If a love of nature and seeing things actually grow count for anything, the effort and expense is amply repaid. As for myself, I can say no work I ever do gives me more real pleasure than actually being able to say, I put every seed in its place and behold the outcome. Should one in my audience be loth to believe my sincerity let him call next summer, and I will give an object lesson surrounded by good, pure air and God's own sunshine.

RECIPES FOR COOKING MALINDA APPLES.

LENA M. FREEMAN, AUSTIN.

APPLE SAUCE NO. 1.—Pare, quarter and core; put into a sauce kettle, half cover with boiling water, add nearly as much light brown sugar as required for tart fruit; put over a steady fire and keep constantly boiling for about an hour, or until the quarters are pink in color. Be sure the kettle is tightly covered so as to retain all the steam. Do not stir once while cooking, or after, but allow them to become cold before even removing from kettle. On this depends the fine flavor, the sauce resembling pears. Eat when cold.

NO. 2.—Quarter and core Malinda apples, do not pare; stick in two cloves in each quarter; sweeten with light brown sugar; allow about one hour for cooking, do not stir. Eat hot with meats. Stick cinnamon could be used with or in place of the cloves, if desired.

Sliced lemon would be good for a change in place of other seasonings, in either No. 1 or No. 2.

Malinda apples are also fairly good in mince pies.

PUDDING FROM MALINDA APPLES.—Pare, remove cores and fill shallow pudding dish with Malindas. Fill cores with teaspoonful of tart jelly, like pie-plant jelly, and a piece of butter or thick cream. Pour over this rice previously boiled thin in milk. Season to taste with sugar and cinnamon or essence of lemon. Bake until apples are done. Eat with cream.

CLOSE ROOT PRUNING TREES.

PROF. J. TROOP, INDIANA EXPERIMENT STATION.

In order to determine whether close root pruning would be suitable for this climate or not, an experiment was begun on a small scale last spring in which four trees each of standard and dwarf pears, Early Richmond cherry, German prune, peach and quince were selected for trial. The trees were two years old and as uniform in size as it was possible to get them. Two trees of each of these varieties were pruned so that not more than an inch or two of the roots remained, and the tops were entirely removed. A hole with a two-inch stick was all that was needed in setting. The other two trees were planted in the ordinary way, leaving all the roots on the tree. Before planting, the trees were all photographed, and after they had completed the season's growth they were taken up and photographed again.

The result of this experiment showed that the peach was capable of producing a magnificent root system and a top to correspond, even after being deprived of all its roots and branches at the start. The dwarf pear also made a fine growth, producing a finer root development than the trees which were not pruned. The standard pear was not quite so good, and the German prune and cherry were next in order. The cherry made but very little growth, barely enough to maintain life. The quinces both died.

While this experiment shows results favorable to the system, it must be borne in mind that the season was an exceptionally favorable one for this work, there being timely rains throughout the growing period. A dry season might produce entirely different results, for that reason we shall continue the experiment for a srries of years. So far, it simply shows what these trees will do when treated in this way under favorable conditions.

Calendar for November.

PROF. S. B. GREEN.

In this section, November is the month in which we should expect but little opportunity to work the soil, since often the ground freezes in the early part of the month. Not infrequently, however, we get from ten days to two weeks in which we can finish our fall plowing and get a considerable amount of work done with the soil which would otherwise have to wait until spring. I think it very desirable to do in the autumn everything that can be done that will make our spring work easier, since at this season of the year we are more liable to have a little extra time.

The work of giving winter protection to our small fruit, roses, trees, etc., should be finished up as soon as possible. If there is plenty of mulch to be had, it is very desirable to put a covering of it over the raspberries and grapes and our herbaceous stuff which have been protected with soil for the winter. This is not so important in the eastern as in the western part of the state, where the snow is liable to blow off and the ground remain bare over winter.

The beds of tulips and herbaceous plants should have a good covering of mulch wherever they are planted, and they will well repay it by their increased vigor in the spring. The strawberries should be mulched as soon as the work can be attended to. I think it very desirable to do this before we have had severe frosts which kill the foliage.

During the bright days of this month, spring work may be helped along by pruning out the weak and diseased wood in currants and gooseberries, and some of our hardy trees, such as the willow and cottonwood, may receive very much needed pruning without injury, bnt most of the pruning is best done during mild days the latter part of winter or very early in the spring.

The hotbed frames for use next spring should be supplied with good earth and covered with a foot or more of leaves to keep out the frost during the winter, that they may be in shape for quick work when the time comes to use them in the spring.

Parsnips and salsify are generally the last vegetables to be left out in the autumn, and, as a rule, I think it better to dig them and carry them over winter in piles on the ground than it is to trust to their going through all right in the rows, for when left in the rows they sometimes get a little discolored or even somewhat rotten at the crown.

Scions for root-grafting in the winter should be cut now and stored in sawdust in a cold cellar. Apple roots should be treated

in the same way. It is not desirable to cut plum scions of our hardy kinds in autumn, because they are liable to lose their buds during the winter even if they are carefully stored, and the chances of success are much better when they are cut at the time the work is done in the spring of the year.

Currant cuttings can be made up now to good advantage, although it would have been better to have them made earlier in the fall. The same is true of willow cuttings. But if the ground is still open after the willow cuttings are made they may be set at once, when if covered with two or three inches of earth they will go through winter in good shape.

After the ground is frozen too deep for plowing, there may be a considerable time in which pipe may be laid for irrigating or a tile drain put in for the drainage of some wet spot.

Biography.

F. W. KIMBALL, AUSTIN, MINN.

The subject of this sketch was born in Reading, Mass., in the year 1844, and spent his boyhood days on a farm in that town. In 1866 he came west to Minnesota, and has passed most of his time since then in civil engineering, though he had two or three years' experience as a farmer in the county in which he now lives. For eleven years between 1878 and 1889, he had charge of the surveys and construction of the Chicago, Milwaukee & St. Paul railway. Since then, as the writer understands, he has been doing railroad construction as a contractor.

Mr. F. W. Kimball's first interest in horticulture in our state dates back to 1874, at which time he planted a good many apple trees on the farm he then owned. There are still a few of these trees living, although most of them were of varieties not well adapted to our latitude. In 1861, he bought the place in Austin he yet occupies as a home, and since then has taken an active interest in fruit growing in an amateur way, and by precept and example has done very much to encourage this industry in his locality and through the state.

Mr. Kimball can scarcely be ranked with the old members of this society, as he first became identified with it in 1892, but he has been very active and forceful in its interests. The value of his services was recognized in his election to the presidency of the Southern Minnesota Horticultural Society the first year of its organization. He has been a very regular attendant at the meetings of the state society and one of its most zealous supporters. Being a comparatively young man, we may expect much further service from him in our beloved art.

Secretary's Corner.

GROW MORE WINTER APPLES.—Mr. A. K. Bush writes: "I put a wagon load of winter apples (Malinda), gathered from *one* tree, into my cellar the other day."

FEBRUARY 1898, "HORTICULTURIST" WANTED.—An extraordinary demand for this number of our magazine has taken the last copy from our shelves, and a search fails to reveal any in reserve, much to the surprise of the searcher. A few copies of this issue are needed by the secretary for binding. Have you one to spare?

STATE FAIR PREMIUMS FOR BEST PECK OF WINTER APPLES.—It is very likely a premium will be offered at the next state fair for the best peck of winter apples, not kept in cold storage. If you have any variety, seedling or otherwise, that will keep till then under these circumstances, do not fail to put away a quantity to compete for this premium. We should know what keeping apples we have.

MEETINGS OF THE IOWA SOCIETIES.—The coming annual meetings of the Iowa societies are to be held:—the State society at Des Moines, Dec. 13-16, and the North Eastern Society at McGregor, Nov. 29,-Dec. 1. We shall undoubtedly send delegates to those two sessions, but their names are not yet announced. Mr. Chas. G. Patten, of Charles City, will represent the latter society at our annual meeting, whereof we are glad.

MINNESOTA TREES BARRED FROM CANADA.—New Canadian legislation prohibits the importation of nursery stock from the United States. This is especially hard on our Manitoba friends who are desirous of getting our hardy Minnesota stock, it being so much better adapted to their requirements than that from east of the great lakes. It hurts the home nurserymen correspondingly. The Canadian law makers evidently think us a "scaly" lot.

THE ANNUAL MEETING.—The regular yearly meeting of our society will be held Dec. 6-9, and the program will be sent to members two weeks prior to that date, either in the magazine issued earlier than usual, or in a separate enclosure. Now is the time to plan for an attendance at this meeting, which is certain to be an interesting gathering. If you are a member of this association, don't miss it; if you are not, come and take that opportunity to become one.

"THE MARKET GARDEN" CHANGES HANDS.—This Minneapolis monthly, giving attention especially to the interests of commercial gardeners, although of nearly equal value for any other, has recently changed hands, and is now published by T. T. Bacheller, who is a member of our society. The new editor is a pusher in a

superlative degree, and will put some of his surplus energy in this work. This journal is now in its fifth year and should succeed, as it is, so far as we know, the only one of its kind in America.

PROF. GREEN'S NEW FORESTRY BOOK.—Our readers may not know that Prof S. B. Green, of the State Experiment Station, is about issuing, under the auspices of the State Forestry Association, a manual of forestry especially adapted to meet the wants of our state. It is to contain descriptions of the varieties of trees found in our state and will be very generally illustrated. As the book will be for free distribution by the society issuing it, a large boom may be expected in its circulation. It will be used as a class book at our state agricultural college.

A "HOME GROWN" MUSHROOM.—

"A thirty-pound mushroom belonging to the polypus family is being exhibited by the Minneapolis Mycological Society, in the Cirkler drug store window. It was found by Dr. Wooding, and is edible."—Minneapolis Journal.

COLD STORAGE FRUIT HOUSE.

F. M. HEXAMER.

To preserve fruit or retard its ripening, it has to be stored in pure air. These conditions can be produced in various ways, but the simplest and least expensive method for the farm use is to build a two-story ice house, the ground floor of which is for the storage of fruit and the upper for ice. The most important part of such a house is the proper construction of the dividing floor upon which the ice rests. The timbers, the size of which depends on the quantity of ice to be supported by them, are so arranged as to have narrow openings between one another to admit the cold air from the ice chamber proper to descend to the storage room, and also to facilitate the dripping of the water from the melting ice. To prevent the water from falling on the fruit, an additional floor or roof has to be constructed under the dividing floor. The best material for this purpose is galvanized,corrugated sheet iron,arranged so that all the water which falls upon it flows into a gutter connected with a leader,through which it is carried into the main drain. Dryness in the storage room being of prime importance, the floor should be cemented whenever existing conditions permit. Of course,ample provision has to be made for thorough drainage, ventilation and circulation of air. Several devices for the accomplishment of this have been patented, and an excellent non-patented plan is minutely described and illustrated in Theron L. Hiles' book on the Ice Crop. The general construction of the walls, roof, ventilation, etc., of such a storage house does not differ materially from that of ordinary ice houses. If the storage house is used much during hot weather, the greater part of the ice will probably have melted before the fall fruit comes in. It will therefore be necessary to have a reserve ice-house near by from which the storage house can be replenished.

A. J. Philips

WEST SALEM, WIS.
Secretary Wisconsin State Horticultural Society.

THE MINNESOTA
HORTICULTURIST.

VOL. 26. DECEMBER, 1898. No. 12.

Biography.

A. J. PHILIPS,

SECRETARY WISCONSIN STATE HORTICULTURAL SOCIETY.

WEST SALEM, WISCONSIN.

(See frontispiece.)

A. J. Philips was born near Philadelphia in 1834. His parents, of Welch descent, were great admirers of fruit and flowers; hence, Mr. Philips' horticultural education began in early childhood. He received a fair common school education, supplemented by a course in a Watertown (Wis.) school. In 1852 he decided to leave school and go to work on a farm in Jefferson county. This cutting short of his schooling he regards as a great mistake, for he has in later life felt the need of a better education. Since 1855 he has resided in La Crosse county. He followed general farming until 1868, when he began making a specialty of apples. In 1870 he joined the Wisconsin State Horticultural Society, since which time he has missed but two of its meetings.

He has exhibited apples at over twenty Wisconsin State Fairs and has been an exhibitor at thirty-eight out of forty fairs held in the county where he lives. He has also taken a great interest in dairying, and at present has a herd of full blood Guernsey cattle. He has also attended and exhibited fruit at several of the state fairs of Minnesota, and has attended many of the winter meetings of that state. His specialty for quite a number of years has been top-grafting apples to produce winter varieties, at which he has been quite successful, having the past season Malinda, Missouri Pippin, Gano, McIntosh Red, Grimes' Golden and Newton bearing fruit.

In 1889, at the suggestion of ex-Gov. Rusk, the Secretary of Agriculture, Mr. Philips was appointed to a position in the Division of Pomology. This position he held for about two years, spending part of the time in Washington and part in traveling through Wisconsin, Minnesota and Iowa, searching for information regarding seedlings and new fruits. This has given Mr. Philips a wide acquaintance with the horticulture and the noted horticulturists of the northwest.

In 1894 he was chosen secretary of the Wisconsin State Horticultural Society, which position he still holds. He selected the

site and set the trees of the new state trial orchard at Wausau, of which he still has charge.

Mr. Philips is worthy of special commendation for the deep interest he has taken in the College of Agriculture. Many of the young men who have reaped the benefits of the "short course" instruction received their first knowledge of the advantages of the course from Mr. Philips. Not only in his own county but in all portions of the state, Mr. Philips has been an earnest advocate of agricultural education. During the past seven years he has visited the college annually and addressed the students of the short course at their literary meetings, always giving them fatherly advice and kind words of encouragement. The students now look forward to his annual visit with a great deal of pride, and try to reciprocate by extending to him the marked respect and cordiality due one who is laboring faithfully for the general welfare of the young men from the farms. We are in need of many like Mr. Philips to help promote the agricultural industries of the state, and no better method can be pursued than by earnestly advocating agricultural education.

R. A. MOORE,
In charge of Wisconsin Short Course

INTENSIVE GARDENING IN THE WEST.—In the spring of 1894 the writer undertook some experiments in intensive farming. A piece of land with a clay loam soil and a clay subsoil containing much iron, with a porous stratum at a depth of four feet, was heavily manured with coarse manure and plowed under. Then the field was well covered with finely rotted manure taken from the hotbeds of the previous season. Then wood ashes were applied at the rate of about four hundred bushels per acre. The fine manure and ashes were well harrowed in, and the land set with early cabbages planted sixteen by twenty-four inches, or over 15,000 cabbage per acre. Then with a Planet, Jr. seed drill, spinach was sown between the rows. After the spinach appeared above ground nitrate of soda was sown broadcast over the field at the rate of three hundred pounds per acre, and a liberal broadcast dressing of land plaster was given. The land was worked frequently, and notwithstanding the severe drouth the crop of spinach was very luxuriant, excelling anything of the kind my customers had ever seen, and my cabbage and cauliflower were the wonder and envy of the neighborhood. In 1895 a portion of this cabbage field was twice manured, as before, and sown with alternate rows of spinach and onions in rows only eight inches apart. The crop was cultivated and weeded twice. The spinach crop was very fine, and the onions yielded nine hundred and sixty bushels per acre. The onions were sown in long rows and at both ends of the rows the land had been ruined by scraping off the surface soil to fill up a hole which was previously too low for cultivation. It is probable that in the middle of the field the yield of onions was in the neighborhood of 1500 bushels per acre, and the yield would no doubt have been heavier with more thorough cultivation.—*O. J. Farmer.*

INSPECTION AND SUPERVISION OF OUR STATE FORESTS.

R. H. L. JEWETT, FARIBAULT.

[Read before Minnesota State Forestry Association.]

Year after year, additional areas of our forests fall before the axe of our lumbermen, almost invariably followed by devastating fires, sweeping away not only the debris left by loggers but with its tongues of flame licking up every green thing in its destructive course; leaving a few standing tree trunks, bare and lifeless, silent witnesses to man's wastefulness and want of foresight.

Thus, year by year, the threatened dangers become more and more imminent, and if these destructive methods are persisted in we shall soon realize the full measure of their baleful influence in the unsightly barren areas spread through our green forests. Our numerous small lakes, now so attractive a feature of our woodlands, will become dry and forbidding; the innumerable small streams will cease to flow; while annually recurring droughts, widespread over our state, will become destructive to our interests dependent upon agricultural advancement.

A desire to avert these threatened dangers impelled many of our more public-spirited citizens to organize this forestry association a little over twenty-two years ago, and notes of warning and words of earnest entreaty have, from that time to this, been published by this association, urging the introduction of some efficient system of forestry protection. These publications have awakened public interest in the subject and have been largely influential in forming a more enlightened public opinion in reference to the importance of forestry preservation. The terrible disaster at Hinckley in 1894 resulted in such widespread interest in the question of some remedial legislation, that the law of 1895 was enacted, creating the office of fire warden for the state, and providing limited means for preventing and suppressing fires; and it is confidently expected that with some modifications of this law, such as the last two years' experience has proven necessary, some of the causes that have produced these fires may be done away with, and the damages sustained from this source be greatly limited if not altogether prevented.

The topic given, to which I am to confine my paper, is, "Inspection and Supervision of Our State Forests."

WHERE AND WHAT ARE OUR STATE FORESTS?

If across the state of Minnesota we should draw a line, commencing at a point on the eastern boundary at the southern line of Pine county, thence westerly along the south boundary of Pine and Kanabec counties, thence across Mille Lac and Morrison counties, crossing to the Mississippi at Little Falls, thence across Todd and Otter Tail counties to the east end of Otter Tail Lake, thence northerly to the west end of the Lake of the Woods this would be a dividing line between the bulk of our pine forests lying to the north and east and our deciduous forest and prairie

lands to the south and west. That portion to the north and east of this imaginary line comprises a territory 180 miles north and south by an extreme limit from east to west of 280 miles—a territory equal in area to the five New England states of New Hampshire, Vermont, Massachusettes, Rhode Island and Connecticut.

The state is now the owner of lands within this area in amounts as follows: Unsold school lands, 343,014; unsold university lands, 46,014; unsold internal improvement lands, 22,208; unappropriated swamp lands, 800,000.

If to these lands we add the amount of school lands that will accrue to the state upon the survey of that portion of this territory now unsurveyed, being sections 16 and 36 of each township, estimated at 906,264 acres; also the swamp lands within the unsurveyed territory, also to accrue to the state, estimated quite conservatively at 950,000 acres, we have a grand total of lands, to be cared for by the state land department, of 3,067,500 acres.

This area will be quite materially augmented by the selection of indemnity school land, necessarily selected within this area, for the reason that all lands within the districts where the school-land losses have occurred are all taken up. The state auditor's report gives the estimated amount of such selections at 60,000 acres.

This enormous amount of acres, if gathered into one body, would give a territory equal in area to the whole of Connecticut (speaking of tax title lands).

I have gone thus into details to show you what a splendid opportunity is given to this state to secure forests which will be of incalculable value to generations to come—an opportunity which, once lost, could not be regained without the expenditure of vast sums of money. I notice that the German government pays from five to sixty dollars an acre for land to set to forests.

A few words as to the necessity of a more extensive supervision than the officers of the state thus far have been enabled to give these forests: The state fire warden, in his report, has alluded to the various causes that result in forest fires, and I have need to simply mention the fact that these frequent forest fires result in our greatest losses, and so long as lumbermen are permitted to leave tree-tops and worthless logs scattered over their cuttings, just so long will the state's timber suffer from fire. The settlers being so sparsely scattered through the pine woods, and no organized towns with officers to act in such emergencies, the fires set or left by careless or ill-disposed persons have full sweep and are only stopped by an opportune rain-storm or some stream of water across its path too wide for the devouring wave to leap over.

I quote a few sentences from the state auditor's report just issued:

"The state cruisers are deserving of special mention for their faithful, honest and competent services. To their watchfulness is due the large amount of trespass discovered, and to their push and energy the large amount of work accomplished.

"During the past 18 months the cruisers (three in number) found and reported sixty cases of trespass, aggregating $17,811.80, and several million feet of uncollectable trespass have also been reported."

These statements would furnish a fruitful text if one were writing a sermon on the degeneracy of our times, affording evidence of the sad moral condition to which many of supposed worthy citizens have lapsed.

The taking of a few loads of wood for use as fuel, by a settler who occupies a claim without any timber upon it, or the hauling off of a set of house logs for a certain stable might possibly be condoned, being so slight a breach of the eighth commandment to demand attention, but when lumbermen and lumber corporations engage in wholesale robbery of section after section of pine timber, it shocks our ideas of morality and might truly cause us to moralize on "wickedness in high places." It would, indeed, sanction the belief that in some lumbermen's code of ethics there is an adaptation of the Spartan parent, who taught his children that the crime of stealing consisted in being caught in the act.

In addition to the cases already cited we may refer to the cases investigated by the legislative committee, appointed in 1893, in settlement of which the state auditor turned into the state treasury $17,082.50.

It is to watch for and drive off these lumber thieves that frequent inspection of all exposed timber is required.

For this necessary inspection and supervision, what system of management shall we recommend? Will it be best for us to adopt as our model some one of the elaborate systems of forestry protection and planting which are in successful operation in several of the European countries, perfected after many years of trial and improvement, or shall we modify our present methods of inspection, amplifying it to meet more immediate want of increased facilities for guarding our present possessions?

In the report of the chief of the Division of Forestry, by B. E. Fernow, published by the United States Department of Agriculture, is to be found quite an elaborate description of the method of German forestry management, covering 38 pages of text, with diagram and description, which, I think would satisfy you all that we, as a state, are not prepared for any such method, if for no other reason than that of its expense of maintenance. I am sure that the cost of preparing a map of *one section* of land for the inspection by the commissioner, who decides as to the disposition of the standing timber and the replanting of vacant areas, would cost twice the amount expended by the United States in the survey of a whole *township.*

In the European systems, which deal with planting of areas cut over, the setting of young trees or planting of forest-tree seed and the sale of each separate tree that, on account of age or some defect of growth requires cutting, is carefully attended to. This entering into so minute a detail we are not yet prepared for.

Neither do I deem it practicable to depend upon boards of county commissions and of township supervisors. These local boards of officers are not often composed of men who possess the qualifications demanded, and are not able to give efficient expert service in the kind of work our calls would require of them. But the more

serious objection is that in nine of these upper counties, having an area of over 800 towaships, we have but seventy townships organized into towns having a board of supervisors; so that in this, by far the larger portion of the territory under consideration, we have no officers to act as inspectors, and a system of appointing such officers would have to be devised; and our method of management would not be uniform and thus somewhat confusing.

It would seem to me that the wisest course and the one that would best secure the endorsement of the legislature would be to have the appropriation for the supervision of state lands now controlled by the efficient state land commissions largely increased—made amply sufficient to multiply three or four times the number of examiners or inspectors. If need be, have one chief inspector, who should not be confined to any district, but travel at will over all our forests; who should be a man competent to advise in all matters of interest in forestry, who should examine the work of inspection done by the local examiners and take notes of all trespassing that shall come under his observation, not with a view of estimating except in a general way the amount of trespass committed, but for comparing his observations with the reports returned by his subordinates. He will thus be able to keep a check upon them and prevent collusion between them and the trespassers and see that no guilty man escapes. He might have among his duties the care of seeing that the attention of grand juries was called to all reported cases of timber stealing; and thus, from the fact that these juries would know that he had full knowledge of all the evidence in the case, might be more likely to return indictments in cases that now are never called to their attention.

When we shall have had laws enacted and begin the reforestation of our cut-over lands, this officer could superintend the work, giving the plan of planting and deciding upon the kinds of trees to be planted.

The state auditor reports that the three cruisers employed by him (with some additional help), during the twenty months under his administration, have examined 800 sections. Recalling to mind our statements of the lands controlled by the state and to be inspected, we will notice that this is less than one-sixth of the area given to be inspected. The auditor adds his comment upon the work done that this last year for the first time have the cruisers of the Land Department been enabled to extend their examination as far north as the international boundary line.

Thus we may readily see that the force at the disposal of the commission, if more than quadrupled, would not, at the same rate of doing the work that his present official corps have done the work, be enabled to cover the territory in eighteen months of time. It would seem important and necessary that some inspection of every tract owned by the state should be given to that tract at least once each year. This certainly should be done to every tract lying near the place where any lumbering operations are in progress.

As I have considered that the Minnesota plan, so-called, and the proposed bill drawn by your committee will embody entirely new

features of management to be suggested from other sources, I do not refer to the plans of inspection embodied in the proposed bill.

All persons who are deeply interested in forestry preservation in our state certainly desire a change in the aspect which our old methods have taken as to the value and uses of our forests. We should treat the state's possessions less as stock of lumber in the rough tree, to be sold at the best possible price or to be held by the state to *bull* the lumber market, but rather manage these forests as a yearly crop, to be harvested when ripened and replanted when cut; and look upon them not as *our* possessions to be realized upon in *our* life time, but as an *estate* to be wisely administered for the good of our children and our children's children.

Let us individually adopt for our golden rule of forestry the precept, "Plant for others as you would that others had planted for you."

"Give fools their gold, and knaves their power,
Let fortune's bubbles rise and fall;
Who sows a field or trains a flower
Or plants a tree is *more* than all."

A PLEA FOR THE FARMER'S WIFE.

MRS. CHAS. E. BLETHEN, WALNUT GROVE.

Now, I have a mind to say a word or two in *favor* of the farmer's *wives*, since reading Mrs. O. C. Gregg's article in the March number on "The Five P's." I wonder if she ever tried to raise "Pansies, Petunias, Phlox, Pinks and Poppies" where a lot of pigs, turkeys and chickens had full sway. I know of more than one farmer's wife and daughter who has tried to raise all these, and more too, living in sight of our own home, whose spirit is discouraged, and on account of it she has become, so far as trying to have the lovely flowers in her yard, a "Poor, Proud, Peevish, Passive, Purposeless" farmer's wife and daughter." I do sincerely believe that if our dear friend Mrs. Gregg, would or could persuade our farmers to fence our door-yards and give us a chance we would show you all what we could do, and perhaps *our own* yard fence would be finished—it is almost a year now since it was begun, and it is just half done. And yet I think I am favored to what many are: but I have more than once after weeding my flowers and sprinkling them in the evening gone out the next day to find a dozen or more chickens enjoying a most luxurious dust bath right in the middle of my choicest kinds. Is it not enough to make one "Peevish," and with all the "Pluck, Patience and Persistence" one has, such a state of things is too "Practical" for the farmer's wife and daughters to raise many flowers.

I enjoyed reading Mrs. Gregg's piece very much, but hope *she* or some one else will write a companion for it to the *farmers*, in behalf of a small plat of ground being fenced for the benefit of the wives and daughters. Most of our farmers think it time *wasted* to put out any labor or strength around the dooryard. Is it too "Practical" to say all that many seem to care for is getting the crops in the ground in the spring, harvesting, hauling it off to market, and some place to sleep and eat while doing it? Oh, for an inspiration, and for more pride to beautify our homes, making them look to the weary, care-worn wife, the most lovely spot on earth!

RECIPES FOR USE OF OUR NATIVE PLUMS.

COMPILED BY PROF. E. S. GOFF, MADISON, WIS.

These recipes have been contributed by several ladies who have had long experience in using the native plums. The native plums, especially those with firm pulp, after being treated by any of the methods mentioned below are well adapted to all purposes for which the foreign plums are used. As a rule, more sugar is required for the native plum, but the preparations are richer in proportion. The harshness in the skin and stone of some native plums is readily removed by steaming them in an ordinary cooking steamer until the skin cracks, or pour over them boiling water to which has been added common baking soda in the proportion of half a teaspoonful to a quart. The thicker-skinned varieties may be readily peeled by placing them in boiling water two or three minutes. The recipes follow.

Stewing.—Use ripe fruit and stew in just water enough to keep them from burning until nearly soft, then add sugar to suit the taste.

Canning.—Pick the fruit when well colored but a little hard; steam or cook in a porcelain-lined kettle until tender; put in cans that have first been treated to boiling water, and cover with boiling syrup made of equal parts of granulated sugar and water, filling to the top; then run a silver knife around the can inside to let out the air, and seal at once. Plums cooked in the syrup are likely to be tough. Canned plums may be used for pies and for mixing with or flavoring other fruits. Plums are often canned without sugar, to be used in winter for making fresh plum butter. The juice of canned plums makes excellent jelly.

Drying.—Desota, Wyant and, doubtless, other varieties may be pared, pitted, spread on plates, lightly sprinkled with sugar and dried, first in the oven and later in the sun. Cook like dried peaches.

Plum jelly.—The fruit should be gathered when only partly ripe—about half colored. This point is very essential. Put plums in a large granite or porcelain kettle—the latter is better—with barely enough water to cover them. Cook until tender but not until they are in a pulpy mass. Having previously covered a large jar with a cloth, strain the fruit in and let the juice drip through, but do not squeeze. When all has drained through, strain once or twice more through another cloth, until the juice is perfectly clear. To one measure of juice provide one measure of granulated sugar, but do not put together at once. A very important point put in the making of all jelly is that only a small quantity should be cooked at one time. Into a medium sized kettle put, say, four tumblers of juice; let it boil briskly fifteen or twenty minutes, then add the four tumblers of sugar, and in a very short time—usually from three to ten minutes—the jelly will be finished, light, clear and delicious. To test the jelly, dip a spoon into the boiling juice and sugar and hold it up; when the jelly clings to the spoon in thick drops, take it off quickly and put into jelly glasses. The plum pulp which is left can be put through a colander and used for plum-butter.

The following point is regarded as important by one contributor: The earlier in the morning and the clearer the day, the better will be your jelly. A cloudy day makes dark jelly, and if not made early in the day the juice requires boiling so much longer that the jelly is dark, and sometimes it is almost impossible to get it to jelly.

Another correspondent writes: "It is well to begin to test it after (boiling) fifteen minutes, taking a teaspoonful at a time onto a saucer and standing it in a cool place for a moment; scrape it to one side with a spoon, and if it is done the surface will be partly solid; then roll the tumblers in boiling water quickly and fill them with the jelly. On the top of each, while it is still hot, drop a lump of clean parafine, which will melt and cover the top tightly, preventing all moulding. If prepared in this way, it will not need to be tied with brandied paper or other special care taken."

Plum butter, jam or marmalade.—Boil the fruit in clear water until nearly done. Remove from the stove and put through a colander to remove the pits. Then rub through a sieve to make the pulp fine. Place pulp in kettle with about half as much sugar as pulp—or if you wish to have it very rich add nearly as much sugar as pulp—and boil down to the desired thickness. Stir almost constantly to prevent sticking to the kettle.

Plum butter, another recipe.—To make very nice plum butter out of Desota, Wyant or any other freestone plum, pare and take out the pits, put in a granite kettle or pan, sprinkle heavily with sugar and let stand over night. In the morning there will be juice enough to cook them in. Stir constantly while cooking and add more sugar if not sweet enough. This way preserves the grain of the fruit and with the Desota plums makes a butter equal or superior to peach butter. If put in glass and canned, less cooking is required than if kept in open jars.

A third correspondent would add: Do not attempt to make a fine quality of either plum butter, jam or marmalade without first steaming the fruit.

Plum preserves.—Use plums that will peel, like Wild Goose or Pottawattamie. No water is required if the sugar is allowed to remain on them long enough to draw out the juice. Boil until the syrup is clear and as thick as honey.

Plum preserves, another recipe.—Take equal weight of fruit and sugar, place in stone jar—a layer of fruit, then a layer of sugar—alternating thus until quantity desired is reached. Let stand over night; in morning drain off the syrup that will have formed into porcelain-lined kettle, place same over the fire and let syrup come to a boil, then pour it over the fruit in jar again; repeat this every other day until the fourth heating, when fruit and syrup are both put in kettle and boiled for a few minutes. Place same in glass jars while hot, seal and put away in some cool and, preferably, dark place.

Plum preserves, another recipe.—To each pound of plums add a pound of sugar; put the fruit into boiling water until the skins will slip; peel and sprinkle sugar upon each layer of fruit in bowls, allowing them to stand over night; then pour off the juice, bring

quickly to a boil, skim and add the plums; cook very slowly till tender and clear, which will take about one-half hour; take them out carefully and put into a pan; boil the syrup a few minutes longer till it thickens; pour it over the fruit; seal or tie them up.

Spiced plums.—Make a syrup allowing five pounds of sugar and one pint of vinegar to each seven pounds of plums; to this add a teaspoonful of allspice, one of cloves, two of cinnamon and one-half ounce of ginger root, tying these spices into muslin and cooking them in the syrup. When it boils add the plums, bringing all to the boiling point, then simmer slowly for fifteen minutes and stand in a cool place over night. Next drain the syrup from the plums into stone or glass jars, boil the syrup till quite thick, pour it over the fruit and set away.

Another correspondent recommends pouring the boiling spiced syrup over the plums in a stone jar, drawing it off and bringing it to a boil every other day and pouring over the plums again until it has been heated five times, after which the fruit and syrup are placed in a kettle, boiled slowly for five minutes and sealed hot in glass jars. This is said to preserve the plums whole.

Other ways of using native plums. The choicest varieties, peeled and served fresh are equal to the finest peaches. By simply covering the fresh plums with cold well water, they may be kept for three weeks or longer, and the water removes all harshness from the skin and pit. They may be kept in good condition for use until winter or the following spring by placing in a barrel or jar and pouring boiling water over them.

ARE HEDGES DESIRABLE?

(SELECTED.)

I have had experience with both Osage hedge and barb wire fences, as well as board and barbed wire, woven wire and board fences. I now have more than two miles of Osage hedge fence, the greater part of which is far better than the average hedge fence. I know that my hedge fences are by far the most expensive fences that I have. In order to secure it, one must first prepare the ground where the fence is to be. He must then build a temporary fence on each side to protect the hedge for the first few years. He then sets out his plants, and works the ground around them for two years. As soon as the hedge is large enough, it must be lopped and tied down. He must then trim at least twice each year, which is worth, on the average, three cents per rod for each time. Now add the cost of plants, the expense of preparing the ground, setting out and care of plants, the damage to the materials used in the temporary fences and the expense of erecting and taking down the same. Reckon the expense for ten or fifteen years, to say nothing of the waste land on each side of the hedge, and I believe that you would have one of the most expensive farm fences possible. Not only that, but the fence is not stock proof and is a harbor for weeds and a dangerous fence in case of fire, and one that will do more to blockade the road with snow than any other used in this part of the country. My advice to the farmers would be, do not set out a hedge for a fence, but if you are unfortunate enough to have one, and it is not in good condition, get rid of it as soon as possible.

THE RELATION OF HORTICULTURE TO FORESTRY.

GEO. W. STRAND, SECRETARY MINNESOTA STATE FORESTRY ASS'N., TAYLOR'S FALLS.

The soil may be rich in all the elements of plant food, yet for want of moisture and trees may be a barren waste. History presents instances enough to clearly demonstrate the fact that where forests wane, all conditions change for the worse. Deforestation and depopulation, without doubt, have always gone hand in hand. Where formerly kings and queens ruled the mighty and prosperous empires of the world, today we find but a sadly disfigured country or a place of desolation.

What more of a proof is necessary to show that the one great problem which confronts the prosperity of a country (the index of which lies in the success of its agricultural and horticultural branches) is directly dependent upon the condition and position of its forest areas. The older, prosperous nations of Europe recognize this fact and its important relation physically and climatically to their country, and have taken steps toward the proper management of their forests, some of which are now yielding them handsome yearly incomes.

Minnesota is a state peculiarly situated in regard to both horticulture and forestry. The scarcity of water and peculiar meteorological conditions, with the decadence of our forests the past few years, have caused much thought and investigation.

History doubtless repeats itself, and if this fair North Star state is to hold its position foremost among the agricultural states, or if horticulture is to go forward, we cannot follow in the wake of some of the older civilization or of the eastern states but must profit from their errors. Our people must come to see the importance of each and recognize the dependence of one upon the other. There must be an equilibrium kept for our greatest prosperity and happiness. The matter of forest preservation and tree planting should concern each individual, for unless our agricultural and horticultural industries flourish the country at large is influenced likewise. It is high time we awaken to the fact and act accordingly—or do our conditions differ materially from those of older countries?

If the waste lands of this state were utilized as a forest reserve, together with the groves and shelter belts which should be found on every farm, the influence, without doubt, would be such as to make Minnesota even a greater horticultural and agricultural state, without maintaining a vast forest area.

The problem of awakening the interest of the farmer and people in general to action is a complex one not many venture to solve. The forestry association has endeavored to do this in various ways for a number of years, but when some great calamity happens, such as the Hinckley fire, this stirs them to action and forcibly presents the need of state or government forest management. Our state is now doing something for their protection, and has done for a number of years something towards the encouragement of tree planting; but the public must be educated to better

understand its importance, before we can expect much hearty support in this direction. Much could be attained through our school system, the public press, farmers' institutes, etc., that would act as incentives to this end.

The settler of the forest region, like his predecessor in the older states, attacks all trees and shrubs, with a mania for clearing everything, regardless of position or the influence they may exert on his future comfort or happiness, leaving his home as exposed and cheerless as on some open prairie. On the other hand, no one feels the need of or appreciates their value better than the prairie resident. Without their modifying and congenial influence, success with fruits would be an impossibility. The benefits derived therefrom largely depend on the position and the method of planting.

The prime object of a shelter belt is for the protection and comfort it affords, and in setting one out there are two essentials that should not be overlooked: first, the trees must not be placed too close to buildings or paths, as drifting snow from them will cause inconvenience; second, choose varieties that will do well in that section and do not use short-lived trees entirely.

Those trees that can be readily grown from cuttings are more commonly seen in tree planting as pioneer trees, and some of them are very desirable. The cottonwood makes a very good tree in places, but, like the Lombardy poplar, it reaches maturity in a short time unless in favorable soil or where its roots can reach permanent moisture. The white willow is one of the most satisfactory and is more commonly used for this purpose than any other tree. The golden willow, as far as tried, seems very satisfactory, and owing to its bright colored bark it is more attractive.

The most practical plan in vogue at present for a shelter belt consists of planting an outside row of willows—green ash or elm is also desirable but of slower growth. A space of three or four rods should be left between that and the next or inner row, to hold the drifting snow. The second set may be a single row or more, as desired, of the same kind of trees, or, quite acceptably, of such hardy evergreens as white spruce or Scotch pine.

Within this enclosure, as soon as our windbreak shall have attained some size, we can safely plant such hardy ornamental and fruit trees as desired. White birch will be found to contrast very nicely with evergreens. Very few farms have any nut trees on them. The walnut, butternut and hickory can easily be grown in most parts of the state and will be found remunerative as well as adding to the attractiveness of the farm and home.

In the selection of the varieties of fruits, we would again urge the necessity of planting only the hardiest standard sorts—leave the novelties for some one else.

It will be found more economical as well as convenient to plan everything in long, straight rows, running them north and south preferably. By planting the apple and plum thus, currants, gooseberries and cherries and top-growing varieties of the raspberry may be grown in the same rows between the trees without injury to either, trees being set about twelve feet apart in the row and the

rows two rods or more apart. Planted in this manner, the plots between can be used constantly and conveniently for cultivated crops, and if the rows of trees and berries are mulched there will be a great saving of labor during the busy season, and they will do the better for it.

That we can and do raise fruit in all parts of the state was proved beyond a doubt to any person interested in the subject enough to visit the horticultural building at the last state fair, under the roof of which was arrayed a display which any fruit-producing state might well have taken pride in.

All of our successful horticulturists are located in timber sections or have surrounded themselves with shelter belts, recognizing the dependence of the one upon the other.

With the rapid clearing and settling up of the land in the east, there has been a notable decline in the fruit industry, and the New England states, New York and Ohio no more boast of their unfailing crops of apples, which with them are no surer crop at present and not as good in appearance or quality as our own, while a quarter of a century ago a failure of the fruit crop was an unknown thing to them.

Conclusively, he is dependent upon forestry not only for his fuel and lumber but also the influences it exerts in checking the force of those piercing arctic blasts as well as modifying the intensity of the scorching winds that sweep upon us from across that section known as the American Desert. Besides the protection it affords to the tenderer forms of plant life, to men and beast, more favorable climatic and crop conditions prevail, and last, but not least, it lends beauty to the landscape and home, wherein the greatest of our civilizing influences lie.

A SOUTH DAKOTA ORCHARD.

OLIVER GIBBS, JR., PRESCOTT, WIS.

The orchard is situated in the town of Ramsey, the northeast town of McCook county, South Dakota, thirty-five miles northwest of Sioux Falls and about ten miles south of the line of the Southern Minnesota Division of the C., M. & St. P. railway. I settled there in the fall of 1885.

Going from Lake City, Minnesota, I carried with me a hundred apple trees, with an assortment of seedling apple trees, native plum, currant, gooseberry, rose bushes, etc., from my own garden there. Of the apples there were fifty Wealthy, twenty-five Duchess and twenty-five of my favorite crabs, and some others that Mr. Underwood wished to have me make a trial of. My object was to grow, as I had always grown elsewhere, a supply of fruits, flowers and vegetables for my own family and of such sorts and qualities that they would suit the market if there should be a surplus of anything.

I buried my trees and shrubs for the winter, and planted them out in the spring of 1886, with ninety more trees obtained from Prof. J L. Budd, of the Iowa College of Agriculture, consisting of apple, pear, cherry and plum, all Russians.

In the spring of 1887 he sent me sixty more, and the same spring I got six more Russians from A. G. Tuttle, of Baraboo, Wisconsin, and the same number from E. Y. Teas, of Indiana. This has been all of my orchard planting except to fill out vacant places in the orchard with seedling apples and native plum trees of my own growing.

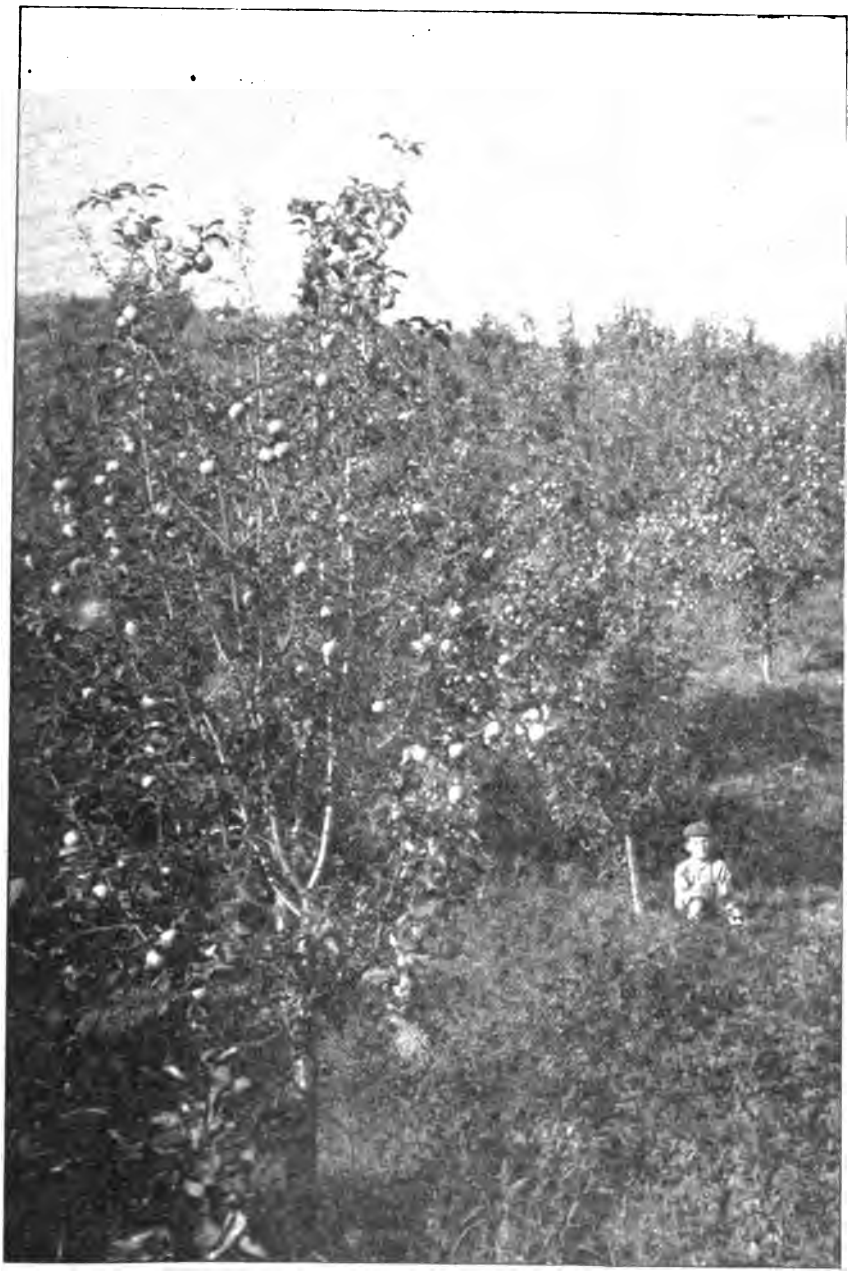
For an orchard site I selected a northeast slope. There was some timber near by on the east and a young grove on the upper side of the slope, southerly—west and north there was full exposure, the windiest place on my farm. This exactly suited me, for I had notions of my own about "protection" of orchards.

I was glad to find my orchard site already well subsoiled by the pocket gophers. This saved me several years' time and a great deal of hard labor in getting the soil and subsoil into proper condition for orchard growth. I did not have to plow or subsoil at all, but just dug down holes about two feet in diameter and set my trees, placing them about four inches deeper than they had stood in the nursery, trampling the surface soil solid over their roots, filling up with the under soil, trampling again and covering with loose fine earth—the dust blanket so much talked of today. This dust blanket I preserved for six years by use of hoe and spade, gradually extending the circle around each tree, till on the average in 1891 the diameter of the clean space was six feet or more, meantime mowing the rank growth of weeds and grass in the intervening spaces twice each summer to avoid "Bre'er Rabbit" using the orchard for his "briar patch."

I had helped to fight the Transcendent crab off the list of the Minnesota society, and often said I would not have this variety anywhere within half a mile of my orchard if I could prevent it. And I planted there in my South Dakota orchard neither this nor any other variety of apple or crab known to be an original blighter; that is to say, found by general observation to be inflicted with the summer blight, when standing in groups or single trees alone. To this opinion and practice I attribute the fact that from first to last, up through five years of the bearing period of my orchard I have had no blight whatever. My neighbors to whom I gave warning that the Transcendent would blight and give out the infection to other varieties, have had their orchards burnt up by this summer blight.

The growth of the trees was slow, for we were passing through a series of dry years that culminated in 1894, when the great crop failure occurred. But the gopher sub-soiling and the dust blanket carried my orchard through in a steady, healthy progress. Some of the trees made a weak growth their first season. but these I sawed off close to the ground the second spring, and in every case but one obtained a strong renewal from the graft. In that one case I had a shrub instead of a tree, which I presume is a French paradise stock, and have preserved it for a curiosity. A number of the trees died out the first season and were replaced.

In planting I did not set the trees "leaning to the one o'clock sun." I could not remember having seen any trees during my boyhood or at



ORCHARD OF OLIVER GIBBS, JR., AND GRANDSON, EACH TEN YEARS OF AGE AT THE TIME PHOTOGRAPH WAS TAKEN.

any other time, forest or orchard tree, in its natural situation, enjoying its own way of growth, having any trouble to stand erect, and I did remember that the winds blew as stiff on the Vermont hills as over the Dakota prairies. I kept my jacknife in my pocket, and my trees came up spreading, stocky, sturdy, shading their roots and trunks, wide at the base, conifer-shaped and erect. Once in a while I would find a crotch forming with the threat of breakage, and this I would prune, but this was all.

My Russian trees from Prof. Budd were mostly of his own importation and of varieties whose fruit I had not seen anywhere in orchard or at fruit exhibitions. I had made a plat and a list for further identification, both of which were destroyed by fire in 1893. Up to that time only the Cross Apple No. 413 and the Titovka (Titus apple), of this Russian list, had come into bearing; the other fruit of '91 and '92 had been Duchess and Wealthy. The Cross proves to be a true all winter keeper, of good grain and good quality, mild subacid, and of extra nice external finish and color, and it is a heavy cropper, but I am not quite sure of its adaptation to our climate in hardiness and would like to see it top-worked on some congenial stock known to be of the first degree of hardiness, perhaps on the Hibernal. By no means would I discard it. Titovka (which must not be confounded with the old Russian Tetovski, with which it has no similarity in the tree or fruit) took my fancy at the start. It is very large, slightly oblong, brilliantly striped, waxy in finish, of good, sprightly, sub-acid flavor, a little coarse in grain, but tender, a better street apple every way than the best Ben Davis, an annual abundant bearer, and the trees, according to their showing in my orchard, perfectly hardy; season of its fruit two weeks later than the Duchess; a good variety to come between the Duchess and the Wealthy. It is one of the Russian "smelling apples," so fragrant that, as Uncle Remus says of the musk melon, it "hollers at you when you go down de road by de gardin."

Of the succeeding Russians I have been able as yet to identify only the Yellow Transparent and the Antonovka. The Yellow Transparent is ready for use in July and has no fault in tree and fruit, is every way desirable for home use and fits our market for a profitable early apple exactly. Size medium to large, form slightly conical, color a rich light yellow, almost white until ripe, sub-acid tender, juicy, good skin and finish to bear handling; a good cropper. There are complaints of this variety blighting elsewhere in Iowa and Minnesota. All I can say of this is what the Frenchman said of his gun: "It no kick me, may be it kick stranger." If I found it blighting elsewhere, I should want to observe its neighbors and surroundings before condemning it. The Antonovka sustains all the recommendations of Prof. Budd, only in the soil and location I have given it it ripens too early and seems to be a misfit as compared to others we have of same season. Possibly on heavier soils and higher elevations it may mature slower and later and be a late fall or early winter apple. In that case I should mark it high in the list.

Of the other Russians fruiting in this orchard, it is of no use to say much till I can identify their names with certainty. One of them is a long keeping winter apple, large, showy, good for cooking and a heavy bearer. Several others range through fall and winter, are apparently valuable, all sizes and colors, none of poor quality. One of these seems to be Repka Melenka. The trees of this variety happened to be planted on a bleak point of the orchard with full exposure to the north and stand as upright as a fence post—but, as I said in a former letter, I have never touched them with my pruning knife, but left them to locate and form their limbs to suit themselves. They make their obeisance to all points of the compass in courtesy to sun or storm, and when the interview is over come up erect, as a tree ought to be. One of them, standing only seven feet high (soil dry and growth slow) had 255 perfect apples on it in 1896 and showed no weakness the following year.

The Russian pears sent me by Prof. Budd have done as well as the apples. There are several varieties, of which I can identify only the Bessemianka. They have been in bearing three years. The older members of the Minnesota State Horticultural Society will remember that I took stock in Prof. Budd as soon as his Russian fruit work became known to us—also A. G. Tuttle, of Baraboo, in the same line—and did everything possible to give them encouragement in the transaction and annual reports of the society; and all these years of observation and experience since 1882-3 have strengthened my belief that the Russian-American foundation is the right one for our orchards.

FREE DISTRIBUTION OF SEEDS BY THE DEPARTMENT OF AGRICULTURE.

J. S. HARRIS, LA CRESCENT.

I consider the free distribution of seeds by the Department of Agriculture, as at present practiced, a great waste of time and money. First, the bulk of the distribution is of varieties that the gardeners and better class of farmers do not care for, and they seldom give them a fair test; second, the common varieties, of which much of the distribution consists, are often old and impure seeds, or varieties not best adapted for planting in the localities where they are sent; third, more than half of them are sent to parties who do not care for them, and they are never planted. The greatest benefit I can see in it is that it affords the members of congress an easy way to make those who have voted for them believe that they are held in remembrance and their support appreciated. Few of the seeds reach those who are of an opposite party from the sender.

I have had more or less experience with these seeds for more than thirty years. I once received a variety of winter wheat that was of superior quality. Rye, oats and barley are seldom planted the second time, and the corn usually must be acclimated by planting it very early and nursing it carefully for several years before it becomes early enough to be reliable and ripen before the autumn frosts. I look upon it as at present conducted as an insult to

American farmers—a useless waste of money, and an unjust interference with the business of our seedmen.

We had hoped that it would meet with a stronger protest from Secretary Wilson, but his advertisement inviting bids for seeds, bulbs, etc., for the next distribution specifies only the most common kinds, such as beets, carrots, cabbage, celery, cucumber, melons, squashes, etc., all of which are on sale in every village or can be procured of any seedman at very low prices, saving much expense to the government and doing away with much favoritism. Besides, the contracts are often to parties of whom we would not care to purchase at any price; and again, they are often sent out so late in the season that they cannot be planted with safety the same year, and the favored recipients who depend upon them are cheated out of a garden.

Mr. J. C. Walker: There is no question but what this free distribution of seeds has been misused, but the object is a good one. It is the object and purpose of the government to import a large amount of seeds and acclimate various fruits to adapt them to this country. The government is importing fruits year after year; it has brought many varieties of apples from Russia and has brought fruits from other parts of the world that have been of great benefit to our country, and if this free distribution of seeds were stopped it would cut off the free distribution of everything in the way of seeds and fruits. I think a great deal of good comes from the distribution of seeds when conducted in a proper manner. There are some people who depend on their member of congress to supply them with seeds and get seeds from the government every year in that way which otherwise they would not get.

Mr. Wyman Elliot: I have been somewhat familiar with this free distribution of seeds, and I have received a great many of them, but I have never yet received any benefit from any that I have received from the department at Washington, and now that we have experiment stations and sub-experiment stations, would it not be wise to first test those seeds at the experiment stations, and whenever they recommend any varieties that are worthy of distribution, let those be the kinds to distribute in the states in which the seeds have been tested. It seems to me that that would be the proper course to pursue, and not take everything haphazard as the department sends it out.

Mr. J. S. Harris: I received four lots of seeds of the earliest kind of flint corn. I planted it, but I lacked enough to finish the piece, so I got enough from Wyman Elliot to finish it. The corn from the seed I received from Washington

was very late in getting ripe, while that I received from Elliot ripened very early. The corn that is grown in the south is not adapted to this country. The seeds sent out are generally of the poorest and most common varieties. I am in favor of the government getting those seeds and testing them. There is no use in spending $180,000 a year for beet seeds of the most common kinds. They used to send out a cheap grade of celery until about four years ago when the Snowball and other varieties came out the government hauled in its horns a little.

Mr. A. K. Bush: In an early day it was a difficult matter to get tame grass seed, and a neighbor of mine sent to the department for some grass seed. The seed was sent to him, and it turned out to be quack grass, but it has staid by him ever since. (Laughter).

Mr. Harris: Last year some parties received what purported to be radish seed, but it turned out to be granite. (Great laughter).

Mr. R. H. L. Jewett: The very fact that the Secretary of Agriculture advertises for bids for those seeds is enough to show that only the most common kinds of seeds will be distributed. I have packages of seeds that were sent me four years ago, and I have never opened them. I have better seeds grown on my own ground. So what is the use of the government spending all this money for seeds that are practically worthless and that half the people do not want and do not plant?

Mr. Elliot: I would move that the secretary be instructed to correspond with the Secretary of Agriculture and our members of congress at Washington and put our society on record as being opposed to any distribution of seeds under the present method: that is, common garden seeds.

Mr. T. T. Smith: Would it not be well for our society to correspond with other societies so that a uniform method of work can be adopted? I understand the members of congress made a great fuss about it when a vote was taken to stop it, and if the people throughout the various states would send in a protest and make it uniform, if all the members of congress were to hear the same protest from their own people, it would have to stop. I think such a course would be more effective than any other.

Mr. Harris: I think societies are very generally passing resolutions against this practice, and I noticed in one or two horticultural journals that societies in various states are condemning it.

SCALES IN MINNESOTA.

PROF. OTTO LUGGER, MINN. STATE EXPERIMENT STATION.

When we compare the conditions prevailing in Minnesota as far as scale-insects are concerned with those in other states, we can be but thankful that such insects are at the present time not nearly so numerous and destructive as they probably will be in the future. This is at least the opinion of the writer, based on long experience, who—some thirty years ago—had to search long and very carefully to discover scales to go in the state collection of Missouri. Nor were they very abundant and easily found in Maryland twenty years ago. Since that time conditions have greatly changed, and scale-insects are now in both the states mentioned more than common. In fact, few fruit trees can be found in those states that are not more or less badly infested, and the insects are still on the increase, not alone in individuals but also in species. In former times economic entomologists did not need to worry about such insects and how to destroy them; now it is almost their chief work in many states to study them with a view to discover remedies against them. It is frequently claimed that Minnesota is too far north to furnish a suitable home for insects of this character. This would be a very good thing, indeed, if such was the case, but all the species that have thus far found their way to our state have prospered well, too well in some cases. Even the San José scale forms no exception.

Before discussing the different species now found in Minnesota, it will be best to describe in a few words the family of scale-insects, or bark-lice. They take their first name from the scale-like covering with which most species are provided, and the second one from their usual place of attachment on the infested plant. Scale-insects are a very anomalous group of insects, and differ very much in appearance, metamorphosis and habits from closely allied families. They are very unlike all other insects, and there is a wonderful variety of forms within the family, and even the two sexes of the same species differ as much in the adult state as members of distinct orders. All, or nearly all, are minute, the scale rarely measuring more than one-eighth of an inch in size, most of them being even smaller. Some of the insects included in this family on account of their affinity in structure, though unprovided with a scaly covering, grow larger as, for instance, the Cottony Maple-scale shown in the illustration.

The young of all scale-insects are small and oval lice which run about actively for a few hours or days, after which they settle down, and by inserting their sucking mouth-parts in the tissues of a plant imbibe its sap and commence to grow. Before long there appears over their bodies a slight covering of a waxy or cottony substance, which serves both for protection and concealment. Soon afterwards the larvæ commence to secrete a firm, papery, shield-like covering, different in the different species, which in time becomes the scale proper. During the completion of this final scale the skin is shed once by the males, twice by the females. Both sexes lose their legs and feelers in shedding the skin and become thus mere immovable

sacks capable only of feeding and secreting the scale. The mouth of a scale-insect consists apparently of a very long, slender and thread-like sucking-tube, which is thrust into the tissue of a plant, serving as a sort of hose through which the sap ascends. To secrete the scale the insect is provided with many spinnerets at the posterior end of the abdomen. The arrangement of such spinnerets, or spinning-tubes, is very constant in the different species, and is made use of in classifying the numerous species of scale insects. These spinnerets are not easily seen, not even with a microscope, and to make them at all clear is a difficult matter, as the insect has to be boiled for many hours in a strong solution of caustic potash, so as to remove all the soluable matter in and about the spinnerets.

In due time the male insect molts for the second time and changes to the pupal state, in which the wings, feelers, legs and other appendages are formed inside the pupal skin. Before long the male emerges as a very delicate, two-winged insect, with peculiar hooks in place of the lower wings, destined to strengthen the upper ones during flight, and with one or two long and tail-like appendages. The male, living but a very short time, requires no food and consequently its mouth has become rudimentary and is frequently replaced by a second pair of eyes.

The female bark-louse always remains under the scale; she stays at home and is evidently not a believer in woman's rights. Soon after the union of the two sexes the male dies, and the female commences to deposit eggs, retiring into one end of the scale, and gradually shrinks during the process to a mere shriveled skin, as indicated in the illustration showing the Oyster-shell Bark-louse. In some cases no eggs are deposited, but the female gives forth living young, as is the case in the related family of leaf-lice or aphids.

The time in which eggs are laid varies with the species, many depositing them during autumn, but most species, passing the winter in a not fully grown condition, deposit them in the spring. The forms of the scales vary considerably, and most of them have such a characteristic appearance that they can be readily recognized by the naked eye. Others, however, can only be distinguished by a very careful investigation.

As these insects travel only in their larval state, they can not readily reach plants, only a few feet away. In this respect they are not nearly as well equipped as the leaf-lice, or aphids, where winged forms appear from time to time to enable the members of too crowded colonies to search and find new feeding grounds. Young scale-insects are often carried upon the feet of birds to distant places, starting new colonies in case the latter alight on plants of the proper kind. This explains the fact why scale-insects are so frequently found near the nests of birds. Other insects also carry them, especially the almost omnipresent ants, who are apt to spread them from tree to tree, so that an orchard will be soon invaded in all directions. The wind may also blow the young larvæ from plant to plant. But man is the main cause of scattering these injurious insects from place to place, from country to country, and not too

much care can be had in inspecting stock, cuttings, etc. before they are planted or otherwise used. An infested nursery can and will spread all kinds of noxious insects or diseases of plants; hence, it should be our rigid rule to buy only from respectable, educated and responsible nurserymen.

The following are a few scale-insects found in our state at the present time. They are all more or less injurious.

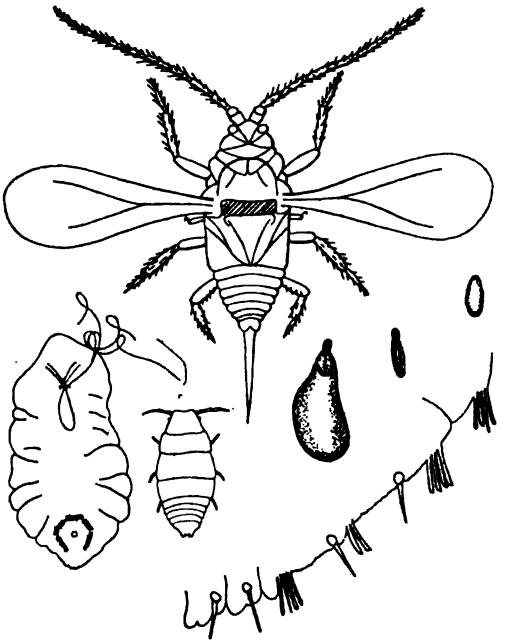


FIG. 1.—Scale insect showing a winged male, a female removed from under the scale, the fringe of its caudal segment with spinnerets, a young louse, male and female scales and egg.

Figure one shows the different forms, stages, etc., of a typical scale-insect, and figure two a colony of the cochineal insect, celebrated because it produces the well known and beautiful crimson color.

The Common Mealy-bugs (Dactylopius species). Several species occur in our state, and every one connected with greenhouses or conservatories is familiar with these soft insects, of an oval shape, bordered with a white fringe, and covered with a white and mealy material. They belong to the worst enemies of the florist and market-gardener. The insects reach a length of one-eight of an inch, but as they multiply very rapidly they soon make up in numbers what they lack in size. They lay their eggs in a loose nest composed of sticky white fibers. The female usually remains on the nest until by her increase in size she is raised away from the plant, still clinging to it with the head depressed and the tail elevated in the air. The larvæ resemble the adults, and the young females change very little except in size. When they are two-thirds

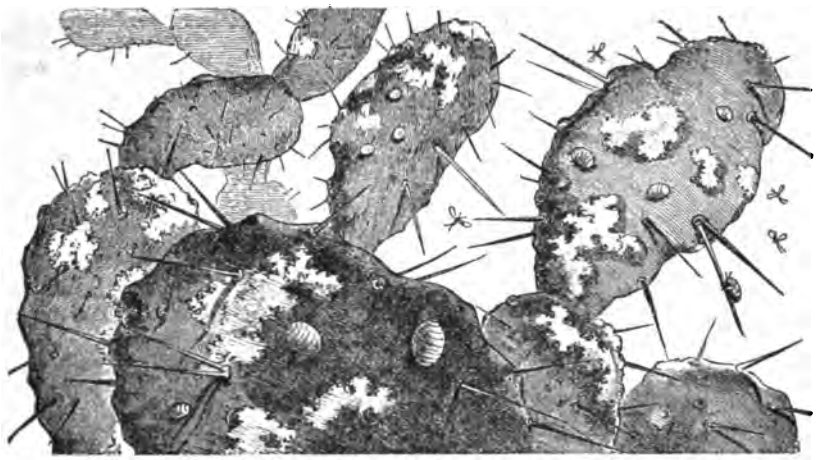


FIG. 2.—Colony of Cochineal insect on a cactus.

grown the males appear, and soon afterwards eggs are laid for the next generation. About six weeks are required to complete the cycle of life; hence, we can have many generations in the course of a year, especially if the greenhouses are kept uniformly warm.

The Cottony Maple-scale (Pulvinaria innumerabilis. RATH) During the first half of the summer many trees, but most frequently the box elders and maples, are infested with this scale, and small tufts of a white cottony matter can be seen upon their branches. This material, when touched, is found to be sticky, and can be

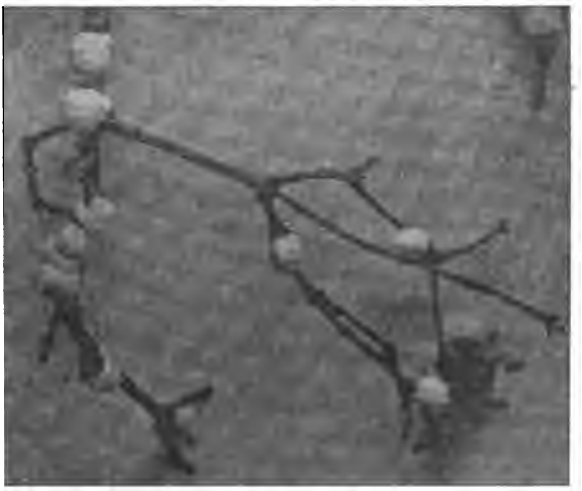


FIG. 3.—Cottony Maple-scale.

drawn out in fine threads. It is a cover for the eggs of this insect. The illustration, figure three, shows a number of such scales with

this white cottony material. If we observe more closely we find at one end a brown or black, saddle-shaped, leathery disk with some wrinkles on its back. This is the body of the insect which secreted the white fibers, covering from one to two thousand eggs of a pink color. The young lice emerge early in July and are very active for a short time, running about from place to place in search of a place in which to settle. The male is much smaller than the female and ceases to grow in a few weeks, becomes stationary and changes to a pupa inside the larval skin, which is covered with a thick coat of wax. The males emerge in August or September. The fertilized females continue to grow until autumn, when they migrate to the twigs and remain dormant over winter. In the spring their bodies become convex, and the eggs, which are deposited from the middle of May till July, are rapidly developed.

A number of other scales closely allied to the two just mentioned are also found in our state.

All members of the citrus family, as oranges, etc., as well as many other greenhouse plants, are greatly injured by the *Hemispherical scale (Lecanium hemisphericum).*

The Willow or Cottonwood-scale (Chionaspis salicis. LINN.*).* The trunks and branches of our cottonwood, poplars and willows are often covered with innumerable, very small, papery and snow-white scales, which give them the appearance of being whitewashed.

FIG. 4.—Willow or Cottonwood-scale.

Two forms of scales can be distinguished, the large female scale, more or less pear-shaped, with two small overlapping cast skins at the apex, and a small oblong male scale, with three ridges running lengthwise and with only one larval skin. The purple eggs are laid during autumn, and they hatch about the first of June into small oval and flattened lice, which are very active, and quickly spread over the tree upon which they were born.

The Elm-tree White-scale. (Chionaspis Americana. JOHNSON). Many of the fine elms in the vicinity of St. Paul and Minneapolis are infested with small scales closely resembling those on poplars and willows but less conspicuous, as the bark of the elm is also spotted with white and, therefore, better adapted to conceal them. These scales are found both on the trunk and twigs and, though in some cases very numerous, have as yet caused no visible injury to the trees. Figure five shows both sexes of this scale.

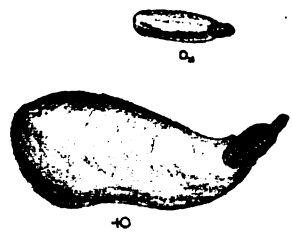


FIG. 5.—Elm-tree White-scale.

The Eccentric Scale of the Elm. (Aspidiotus ancylus. PUT.) Some of our silver maples and elms reveal the presence of a small gray scale, which so closely resembles the color and texture of the bark to which it is fastened that it would be still more difficult to see it if it were not raised above the smooth surface of its resting place. Such scales, about one-sixteenth of an inch in diameter, are somewhat circular or oval, are usually found together in groups of of all sizes from three or four to one hundred or more. It frequently happens that the scales overlap each other, and some of them are thus pushed upon the backs of their fellows, so that they do not touch the bark at all. The advantage of a long thread-like beak as a mouth is now apparent, for with it the insect can draw its supply of food from the plant between the scales and underneath. The scale of the female has two small excuviæ, the smaller of which constitutes a yellow or orange dot placed eccentrically at one side of the center of the scale; hence, the name, "eccentric scale." This species does not occur in sufficient numbers to cause much damage, but as it may be mistaken for the true San José scale it is here described. Figure six shows both sexes of this scale.

FIG 6.—Eccentric Scale of the Elm.

The Gloomy Scale. (Aspidiotus tenebricosus. COMST.). In the south it is a dangerous scale, which, although it spreads rather slowly, in course of time covers the branches of the largest maples, often causing their death. With us this scale is rather uncommon, but it is perfectly able to withstand the rigors of our winters. The scale is dark gray, roundish and larger than the dreaded San José scale, the female having a diameter of one-fourteenth of an inch.

The Oyster-shell Bark louse. (Mytilaspis pomorum. BOUCHE.). This is one of the best known scales, having been described over eighty years ago. It attacks the apple and many other orchard trees; most deciduous trees do not escape, however, if the scale becomes at all numerous. The female dies early in the fall, and her shriveled body may be found during winter underneath the scale. Behind her are the numerous eggs, forty to ninety, which pass the winter in these well protected shelters. The scale has been reported as being found in our state, though the writer has as yet not seen any specimens. It can cause considerable trouble and damage, but seems to thrive best in a more southern climate.

The Scurfy Scale (Chionaspis purpurus. FITCH.) is also found upon the apple tree.

The San José scale has been treated upon in an earlier issue of the Horticulturist.

KEROSENE FOR CATERPILLARS—Last year there were more than a thousand nests of caterpillars on my trees. When they first hatched I took a pail of kerosene and a swab on the end of a long pole. I dipped the swab into the kerosene and rubbed it over the nests and the caterpillars. This destroyed them so that I saw no more of them last year.

THE PROGRESS OF HORTICULTURE IN WESTERN MANITOBA.

H. L. PATMORE, BRANDON, MANITOBA.

If you look at the map of North America, you will find that western Manitoba is a stretch of land lying to the north of North Dakota. It is a prairie country, open to the winds which sweep over it from the west; of very high altitude, with few rivers or water stretches and away from the atmospheric influences of the lake region; with a climate which is very different from that of eastern Manitoba or of Minnesota, it being of higher altitude and with a drier atmosphere, and with very little bush or mountain land. Its soil is very varied, from light sands and gravel subsoil to rich sandy and clay loams, the average being a rich sandy loam.

It is a country where the history of horticulture has been a series of failures and disappointments until many began to think that the cultivation of trees, fruits and horticultural products generally were impossible and that it was useless to waste any further efforts in planting trees and plants which, although often growing thrifty at first, would generally die back the first or second winter. But now in 1897, we are able to tell you, the members of the Minnesota State Horticultural Society, of progress of horticulture in the Canadian West, for recent years have proved to us that there are possibilities for successful horticulture even here. Considerable progress has already been made in the cultivation of the small fruits and in the growing of many varieties of ornamental trees, shrubbery, plants, etc., which have been found to be hardy and useful here, not only on the well-cared-for grounds of the experimental farms, but in the towns and villages, and also by the farmers and dwellers on the exposed prairie.

The pages of the Minnesota horticultural magazine are very interesting reading to us here. You have had many of the experiences in horticultural pursuits which are now falling to our lot. Your state was at one time at the same stage at which we now are, with many untried possibilities awaiting development, and we can learn much to guide us from the successes and failures which you record. The remarkable showing which you have made in the cultivation of fruits in the state of Minnesota in the last few years cannot fail to impress us with the idea that when once we, like yourselves, have found how to overcome our defect or effect of climate, we may be able to turn our horticultural possibilities into horticultural realities, and that the range of successful horticulture will be carried still further north to aid and increase the future comfort and prosperity of the people who dwell on these fertile prairies.

When the first settlers came to this western country from the older provinces of the east, they remembered the orchards of their former homes and, doubtless, thinking that land which was so favorable to the growth of grain would also be favorable to the growth of trees, they procured and planted some of the varieties they were most familiar with, in the virgin soil around their new

homes. They also attempted to produce gardens with the same varieties of vegetables which they had grown at their old homes. But they soon learned that here the climate and soil were different, for the transplanted trees failed to grow, the apple trees died from heat or frost, and the vegetables failed to mature. That was the beginning of horticulture in western Manitoba, and to many, for the time, it was also the ending.

Up to the year 1890, vegetables were not generally grown and were always scarce; but about that time it began to be seen from the success which a few careful gardeners were experiencing that by a careful selection of hardy and early maturing varieties, all kinds of vegetables could be grown here, and during the last few years, western Manitoba has produced the choicest of vegetables in great variety and profusion, even to celery and tomatoes, many bushels of which latter were ripened on the vines in the open air during the past season. Black, red and white currant and gooseberry bushes, raspberry canes and strawberry plants were found growing in a wild state in the ravines and along the river sides and lowlands. These were transplanted, and for several years the settlers were contented with the fruit of these, and they found a ready sale in the towns and villages which were springing up. Bushes of the cultivated varieties of currants were brought in from the south and east and planted out, but it took them some years to become thoroughly acclimated; but now the wild varieties are being dug up and thrown away, for it has been found that no country on earth can produce better or heavier crops of the best varieties of currants than can be grown here.

With gooseberries, we have not been quite so successful. The Houghton is the only variety so far found to be generally hardy with us. In some places, however, Smith's Improved and Downing are being grown, but they do not seem to be suited to general cultivation here.

In red raspberries, we find the Turner and Philadelphia do well with us, and are the best for general cultivation. Many other varieties, however, are being grown successfully in places, some soils and situations being evidently favorable for a variety which would be perfectly useless in another location.

Black raspberries and blackberries give us some trouble, and we have evidently something to learn before we can make a thorough success of their culture. We experience some difficulty in getting the young plants to live when transplanted; once established, however, they are very productive but a little tender to hard frost and excessive heat. Perhaps, we can learn from some member of your society how to care for them better.

There are a few who have made a success of strawberry culture here, but the growing of grain crops, where so much of the labor is done by machinery, seems to make men here indisposed to give as much attention as is needed to make a success of strawberry culture. I have grown the Crescent successfully for nine years, and have now growing some twelve varieties, all of which I find are equally hardy in the sheltered belts which I have planted for them.

As I see you have often debated the question of the best varieties, I may say that I find the Crescent, with Capt. Jack as a fertilizer, and the Warfield, with Michael's Early or Warfield, have up to the present been the best varieties with me.

With the larger fruits we have not as yet had any success. On the Dominion experimental farms, here and at Indian Head, more than 500 of the hardiest known varieties (including seedlings of northern origin and Russian importation) of apples, crab apples, pears, plums and cherries, have been planted during the past ten years, but not one of them has been found hardy enough for successful cultivation here.

Recent plantings of young seedling plum trees of northern origin are more promising, and there is reason to hope, at the present time, that in a few more years we may be able to add the plum to our list of cultivable fruits. One thing is certain; the fact that wild plums and wild cherries are found growing in many districts around us proves that the plum belt extends even this far north, and that there is work here for the horticulturist to persevere in its improvement. Where the plum will grow, there is room to hope that we may yet find some new varieties of apples and hybrids which will prove successful in our soil and climate. The writer has watched the trees carefully for many years and is of the opinion that it is as much a question of soil and situation as of the hardiness of the variety, and is inclined to question whether it is really the intense frost that kills the wood. We would be glad to get an expression of opinion from some of your members who have had experience on the subject. I have several hundred young trees of the best varieties grown in Minnesota, planted in between shelter belts of hedges of box elder, and am watching anxiously to see what measure of success will be attained with them.

There are several wild fruits, such as sand cherry, buffalo berry and wild grapes, which are being brought into cultivation here. These are very hardy and may prove useful, but it remains to be seen whether they will be of sufficient value to repay any great amount of trouble being expended upon them.

This is a brief review of the experience we have had here so far with the cultivation of fruits, and I send you this trusting that it may prove of interest to the members of your society, and that we may be able to obtain from your experience and information that which may help us to further progress.

With the cultivation of forest and ornamental trees and shrubbery, we have had a greater measure of success, having now a long list of, suitable hardy varieties to select from. With your permission, I would be glad at some future time of an opportunity to tell you what kinds and varieties of trees, etc., are doing the best with us here in the far north.

Squashes and pumpkins may be kept in any dry airy place until freezing weather, and then put in the cellar. Onr of the best methods of preserving squashes for winter use is to give them a coat of varnish. Many are familar with the process of varnishing eggs to preserve them; squashes treated in the same way will keep all winter. Handle squashes carefully; if they are bruised or the steme broken they will rapidly decay.

OUR MISTAKES IN ORCHARDING.

EDSON GAYLORD, NORA SPRINGS, IOWA.

The first and most important requsite to success in orcharding is a good location; this being secured, half the evils are shunned. A location that gives the most even temperature, that is the least subject to sudden changes, especially from hot to cold, a high elevation on a northeast slope, with a heavy, rich clay loam is best. Sudden drops close alongside are an advantage, and if filled with deep water all the better. A large body of water or timber on the southwest much enhances the value of a site over one having opposite conditions. A heavy body of water on the west or north, often makes the line between success and failure caused by late spring frosts; while a thick grove on the west and north often brings failure, where except for the grove the crop might have been abundant. It is a deplorable fact that three-fourths of our old orchard sites have been selected about our homes in the most unfavorable places—such as slope to the sun—and are the most thoroughly protected, cosy sites found. The labor we have given in shutting in orchards on the west and north and opening them on the south has been worse than thrown away.

As a rule, we have ruined our orchards by misplaced kindness. Instead of setting our trees with heaviest branches on the sun side, we are growing them thus till bearing age. We have followed that charming word, "*symmetry*"—a word so many fruit writers seemed to have swallowed many years ago,and up to date it seems so hard to forget. We have set and grown for symmetry, but our trees have all the time rebelled, and, with the persistence of a hungry tiger, they have sent their roots and branches at once over to the northeast side. They have been in a desperate search for cooler air and damper atmosphere. Had we protected them by growing their heaviest branches on the sun side and by frequent and thorough cultivation or heavy mulching, our trees would not have played truants, as they have, by growing in the wrong direction. One strong limb grown to the sun is worth a dozen growing from it. We have revived many trees by trimming to let in the sun and air. In the East this is all right, in the Northwest it is all wrong. They have too much cool, damp air, and need more sun; we have too much warm air and hot sun. They train their trees to let in the hot air and sun, we to keep them out.

While we have an unmeasured amount of scorching southwest winds, they are scarcely troubled with any. In their cool, damp soil, trees need setting more shallow than here, where our soil is so rich, loose, black and warm. With our light snows and excessive freezing, with our trees all started on tender roots, how can they help but perish? It is a mystery not that they have been injured as they have, but that they have lived at all. When we all see and *know* that we must have trees grown on *hardy roots*, with *hardy stems*, grown to the sun and not from it, we shall meet with such success as will astonish the tree croakers and put the defenders of Horace Greely to their wits' ends to keep us from growing choice apples in the Northwest.

I once asked Peter M. Gideon, what he thought the difference between a southwest slope and a northeast one. "I would rather have," said he, "one acre on a northeast slope than forty on a southwest for apples. A soil that would do fairly well on the northeast slope, would be a failure on the southwest."

A soil of sand or gravel, either in surface or subsoil is bad. A heavy blue clay, unless elevated and sloping, is bad. If we reflect a moment on the effects of the hot southwest winds and the direct rays of the sun, we can but see a vast difference in favor of a northeast slope. Both the sun and the wind strike with double force on all sites open and facing southwest, while both as they pass over the northeast elevation but slightly affect the soil about the roots and whatever effect either may have is more evenly distributed on all sides of the tree, on both its roots and branches.

Another evil has been in dealing with strangers, who, as a rule, are without honor and are neither reliable or responsible. I am near seventy and never dealt with strangers. I never have been humbugged a dollar in my life. Then why deal with strangers, since there is no law in America that can compel you to?. A humbug is the easiest bug I know of to get rid of. Let him alone, and he is harmless; but when once you commence dealing with him, you will find him the most detestable of all beings. Thousands of dollars —*hard earned*—are annually thrown away by dealing with unknown agents. If you are in doubt as to what you want and where to best get them, consult with some one you *know* knows. If he is not near, write him full particulars of your conditions and wishes; send stamps to pay postage and paper, and you will find this will bring you the best returns for the investment you have ever received. There are plenty of *good reliable nurserymen*, that I would be free to guarantee their dealings to be honest, honorable and fair. Be no longer duped by the theory of getting trees on whole roots or on budded stock. I have a letter just sent me asking me to furnish whole root seedlings to start trees by setting the scions into the crown and using the whole root, which is, in ninety-nine cases in a hundred, *a very tender root*. This may be well in tender climes, but perilous in the Northwest. Take your grub ax and grub out a few old,decaying trees—crab trees,if you choose—and you will find the under set of roots, that the trees were first started on,black,dead and often rotten and gone, and the tree still clinging to life by a few hardy roots that have struck out for themselves from the hardy trunk. Seeing this you need no other argument. The evidence is *prima facie*.

For my part,I am lead to wonder that our trees have succeeded half as well as they have. I have noted some of the many evils that have and do confront the orchardist here in the northwest. The remedies I have suggested have been gathered from over forty years' observation and experience. Brevity has forced me to pass over many points of interest I should have been more than pleased to have presented here.

In closing, I wish to present to you the greatest and grandest

living fruit problem of this present age. It is a live issue and freighted with far more significance than many are yet ready to admit. I refer to top-working to secure hardiness, which if properly done will completely revolutionize the fruit question here in the Northwest. It is giving us the shortest and surest road to success now known. That there have been and will be many serious failures along this line of progress, I am free to admit. I have made very many serious mistakes myself on this line. But that this important problem is now mostly solved, I have no shadow of doubt. From now on the great majority of errors that have presented themselves have been overcome, and many obstacles of hindrance have been removed. In short, the way now is so plain that he who runs can read and shun error. Select young, vigorous, standard trees that are known to be extremely hardy. See that these have been grown mostly on their own, hardy roots. Use no crab stock for standard apples, except for some specific purpose. For best results, grow these stock trees to about seven years old. Commence when you first set them to grow as many branches as possible to the sun, setting the scions in the same direction. First, graft about one-third of the topmost shoots with late-keeping varieties the next season; then set about a third more next lower with earlier varieties, leaving the rest for future consideration. I am not now sure it will ever be best to remove the original lower limbs, as these may aid in toning up the vitality of the tree in trying seasons.

By this new departure we are surely going to win back most of our old choice varieties. Top-working is the missing link we have so much needed and so persistently sought for. We now have it, and on it we are going over turbulent Jordan dry shod and with it scale the walls of Jerico.

THE MINNEAPOLIS MYCOLOGICAL SOCIETY.—That this new organization devoted to the study of the mushroom is doing good work may be judged by the following report:

The Minneapolis Mycological Society had its regular weekly meeting on Monday, Oct. 3. All the members were present, with a large number of new members enrolled, and a goodly number of visitors. There is a fascination about this new forest food, and the varieties exhibited show that the members have not been inactive in canvassing the fields and groves in this vicinity. Although many varieties have been shown at previous meetings, new ones were brought forward, notable among which were several varieties of the boleti, the edible and unwholesome, and specimens of the tree fungi, which is more abundant in the fall than in other seasons. The Pleurotus ulmarius was shown and also the Pleurotus ostreatus. The main object of this society purports to be the distinguishing of edible mushrooms from those that should be avoided, and if, as is often stated, quantities of this valuable and sustaining food are going to waste on our lawns and woods, it is a good thing to know where proper information regarding it can be obtained. The much maligned mushroom is now having a fair show. Any one not a member may bring specimens of fungi that he finds and have them classified. Strangers from both St. Paul and Minneapolis are invited to attend the meeting of the society at Dr. M. Whetstone's, 408 Nicollet avenue, room 305, on any Monday evening.

Lillie C. Flint,
Secretary of the Minneapolis Mycological Society

St. Paul, Minn., 720 Igelhart Street, October 6th.

BLIGHT ON THE APPLE AND PEAR.

Until 1880 nothing was definitely known regarding the nature of this malady. In that year Prof. Burrill, of Illinois, published the first authoritative account of the bacterial, or "germ," origin of this disease. Prof. Burrill's investigations were afterwards abundantly corroborated by the careful work of Prof. Arthur, at the New York Experiment Station. The disease is known to be caused by a bacteria now recognized in science by the name of *Micrococcus amylovorus*. Prof. Arthur proved the *contagious* character of the disease, and also its bacterial nature, by demonstrating that it could only be transmitted artificially by using the juices of branches which contained the characteristic bacteria. This disease finds the most congenial conditions for rapid development in fast growing varieties having an abundance of succulent tissue. It usually obtains an entrance by way of the youngest leaves or through the blossoms. At this time, too, wood is in an immature condition. The bacteria causing the disease may remain alive in dead branches on the tree, and also in those which have been removed, and in this way communicate the disease to healthy trees.

REMEDIES:

No directly effective remedy is known at the present time. The following of a preventive character should be applied:—

1. Prune off and burn all blighted branches as soon as noticed, cutting 12 or 15 inches below the diseased wood, as shown by the blackened and shivelled bark, painting the cut surface with linseed oil.
2. Follow such a system of culture as will tend to produce a moderate growth of well ripened wood.
3. If an orchard which has been cultivated previous to the attack is seriously affected, try seeding to clover for about a year; this, coupled with a liberal top dressing of wood ashes, may tend to lessen liability to the disease. In a case of this kind avoid using barnyard manure.
4. Grow, as far as possible, the varieties which in that particular locality have shown greatest immunity from the disease.
5. Transcendent and Siberian crabs often act as breeding places for the disease.—*Canadian Horticulturist.*

STORING VEGETABLES FOR WINTER.—Nearly all vegetables may be kept plump and fresh all winter if properly stored. Cellars are unhealthy places unless kept cleaned and well ventilated. A ventilator should extend from the bottom of the cellar to the top of the house. It can be closed in very cold weather. Keep the cellar open as long as possible in the fall. Do not allow it to get to warm during the winter. Just above the freezing point is about right. Regulate the heat by means of a thermometer. If the temperture should fall to or below freezing point, hang a large stable lantern from the ceiling or a large lamp may give off enough heat to keep the temperture right.

HOW TO EXTEND OUR MEMBERSHIP AND USEFULNESS.

A. K. BUSH, DOVER.

The annual meeting of 1898 will soon be on us. Of course all intend to go. We cannot afford to stay away from these gatherings. December is the month for rest, recreation, and as these opportunities come to us to meet our friends, swap ideas, compare results, methods, etc., also to talk over matters horticultural in general—we should certainly improve them.

The man who has not learned and done something good and useful during the year which will help himself, his neighbor and the world in general to do and be better ought to have died last year.

The railroads make us the very low fare of one cent per mile for the return trip; the hotels special rates. Your friends in the great Twin Cities are always glad to see and entertain you, showing you the immense stores and stocks with their "bargains," "special sales," etc., from which you may, possibly, save much more on your winter supplies than the entire cost of the trip—in addition to the store of knowledge and pleasure gained at the meeting. Again, the papers and discussions given by practical men in your business may be of more value to *you*, if properly applied to your next season's work, than all you would do without these helps.

Invite some friend who is interested in our work to join the largest and best horticultural society in the United States, and to go with you to *instruct* and be *taught* on the "mutual plan." Go prepared to *do* good and *gain* good—in *your* way. I know every member of our society could easily secure the names of one or more of his neighbors who would be glad to pay $1.00 per year for our magazine. The annual reports, plant premiums, etc., with all courtesies of the society added—and at the same time secure a copy of Prof. Green's "Amateur Fruit Growing" as special premium for himself or some worthy neighbor. Try it and be convinced. I expect to "bring in" several dollars with memberships. Shall we unite in this effort?

Dover, Minn., Nov. 14.

EASY WAY TO SLIP ROSES.—In the fall, before frost comes, I secure as many varieties of rose slips as I can. These I place in a little trench, burying the larger part of each slip and leaving about two inches above ground. Next I take several old glass cans, which I have saved for the purpose, and turn over the slips. If the cans are cracked, it does not matter. My rose slips are then left in this condition until spring, when I remove the cans and find they have rooted and are ready to transplant to mounds or borders, and will soon become thrifty little bushes.

PROGRAM

OF THE

Thirty-second Annual Meeting of the

Minnesota State Horticultural Society.

To be held in the offices of the County Commissioners in the Court-House, at Minneapolis, Minn., Tuesday, Wednesday, Thursday and Friday, December 6, 7, 8 and 9, 1898. Ladies are especially invited. Send or bring questions for the Question Box.

ANNOUNCEMENT.

The meeting will be held this year in the same rooms—those of the County Commissioners in the Court-House—as last year. The two smaller connecting rooms will be used for the fruit exhibit, and another room adjoining will be used for a cloak room, where garments, etc., will be checked and cared for free of charge to those attending. To reach these rooms from the Fourth Street entrance, take the elevator up one flight and turn to the right.

The general features of the program will be found to be very much as last year and along the same line as our previous work.

Please note that the entertainment by the Farm School, with Prof. Green's "Lantern Talk," comes on the evening of the closing day of this session, and that day is devoted to apples, making it one of the most interesting days of the meeting. Come prepared to stay through and help make this our best gathering.

At some convenient time during the meeting it is expected that Prof. N. E. Hansen, Horticulturist at the S. D. Agricultural College, will give a talk on his experiences in Northern Asia, in search of new fruits and plants. It will be remembered that he spent the larger part of the year 1897 abroad in that work, and he must have many interesting things to tell of his experience.

Representatives of other state societies will be with us as usual and add to the value of the occasion.

Hotel Vendome, 21 South 4th Street, (between Nicollet and Hennepin Aves.) has been selected as headquarters of visiting members and friends, and special rates secured of 50 to 75 cents per day of one in a room; two in a room for 75 cents to $1.00 per day. Two of the best popular-priced restaurants in the city are located on the ground floor of this block. Register as "horticulturists," and you will be well treated. A very comfortable and pleasant hotel, with all modern conveniences, only one-half block from our secretary's office and library, in the Kasota Block, and four blocks from the Court-House. Our people enjoyed it very much there last year.

TO THE BEE-KEEPERS.

The officers of the Minnesota Bee-Keepers Association announce that the annual meeting of that society will convene Wednesday and Thursday in the same building with the Horticultural Society. Purchase tickets to the Horticultural Society meeting and get the reduced rates.

THE WOMAN'S AUXILIARY TO THE MINNESOTA STATE HORTICULTURAL SOCIETY.

This society will hold its annual session on Friday, at 10 a. m., in some room in the building, to be announced at that morning's session of the Horticultural Society. All ladies interested in horticulture are earnestly invited to be present and connect themselves with this association.

REDUCED RAILROAD RATES.

READ CAREFULLY.

A reduction to one-third railroad fare for the return trip has been secured on condition that *one hundred certificates*, showing that the fare has been paid coming to this meeting, are presented to the railroad agent at Minneapolis. It is certain that this reduction can be secured if ***each person attending*** obtains such a certificate from the railroad agent at the time of purchasing the ticket. *Do not fail also* to get a similar certificate *at each transfer point* where you have to purchase a ticket on the way to the meeting. The certificate secured with the *last ticket bought* before reaching Minneapolis is the most important and the *only one* that will be counted in the required "one hundred."

N. B.—On reaching Minneapolis turn these certificates over to Secretary Latham at once.

All the railroads in the state south of Minneapolis, also the Great Northern and Northern Pacific railways, offer this reduced fare.

DO NOT FAIL TO GET CERTIFICATES.

Come, *everybody* interested in any branch of horticulture! It is *your* loss if you stay away.

Will the papers of the state please give wide circulation to this notice.

For further particulars, address

J. M. UNDERWOOD, President,
Lake City.

A. W. LATHAM, Secretary,
207 Kasota Blk., Minneapolis.

PROGRAM.

TUESDAY MORNING SESSION.

10 o'clock.

General Subject—Strawberries.

Organization.

Appointment of committee on credentials.

NINE FIVE MINUTE PAPERS.

The Old Favorites among Strawberries, C. A. Sargent, Red Wing.

The Valuable Newer Varieties of Strawberries, W. S. Widmoyer, Dresbach.

Methods of Planting Strawberries Compared, N. C. Ernst, Dodge Center.

The Matted Row System of Strawberry Culture, Geo. R. Widger, Chatfield.

The Various Systems of Strawberry Culture Compared, W. E. Fryer, Mantorville.

My Method of Harvesting the Strawberry Crop, A. G. Long, Excelsior.

Bookkeeping for the Berry Picking Season, R. H. L. Jewett, St. Paul.

The Art of Originating New Varieties of Strawberries, C. F. Gardner, Osage, Ia.

How to Get the Largest Crop of Strawberries with the Least Labor, John Eklof, Stockholm.

Announce renewal of membership. Annual fee, $1.00. Pay to the secretary.

TUESDAY AFTERNOON SESSION.

2 o'clock.

General Subject—Shelter Belts and Screens.

Forestry, Elmer Reeves, Waverly, Ia.

TEN FIVE MINUTE PAPERS.

The Economic Value of Shelter Belts about the Home, Hon. S. M. Owen, Minneapolis.

The Fruit Garden with and without the Shelter Belt, Prof. W. W. Pendergast, Hutchinson.

The Place of Evergreens and Deciduous Trees in the Shelter Belt, C. L. Smith, Minneapolis.

The Location of Shelter Belts and Their Uses and Value, Geo. W. Strand, Taylor's Falls.

Best Varieties of Evergreens for the Shelter Belt, S. D. Richardson, Winnebago City.

3:30 o'clock. Ten minutes intermission.

The Shelter Belt in Manitoba, H. L. Patmore, Brandon.

Shelter Belts for Both Timber and Prairie, Prof. W. M. Hays, St. Anthony Park.

Hints from Experience in Growing Shelter Belts, C. B. Clark, Minneapolis.

How to Secure a Deciduous Tree Belt, T. A. Hoverstad, Crookston.

The Shelter Belt as a Factor in Stock Growing, O. C. Gregg, Lynd.

Appointment of committees on award of premiums, president's address, obituaries and final resolutions.

WEDNESDAY MORNING SESSION.

9 o'clock.

General Subject—Fruit List, Reports, Currants and Gooseberries.

Reports from local societies.

(To be filed for publication without reading).

Robert Parkhill, Sec'y S. Minn. Hort. Society.
A. W. Keays, Sec'y Meadow Vale Hort. Society.
A. K. Bush, Sec'y Dover Hort. Society.
E. M. Ricker, Sec'y Hubbard Co. Hort. Club, Park Rapids.

Report of committee on fruit list.

Clarence Wedge, Albert Lea.
J. P. Andrews, Faribault.
Prof. S. B. Green, St. Anthony Park.

Reports of superintendents of trial stations.

(To be filed for publication without reading).

Prof. S. B. Green, (Central Station), St. Anthony Park.
E. H. S. Dartt, Owatonna.
Dewain Cook, Windom.
Clarence Wedge, Albert Lea.
Chas. W. Sampson (grapes), Eureka.
O. M. Lord (plums and small fruits), Minnesota City.
H. M. Lyman (apples), Excelsior.
J. S. Harris, La Crescent.
L. R. Moyer, Montevideo.
Mrs. Jennie Stager, Sauk Rapids.
William Somerville, Viola.

NINE FIVE MINUTE PAPERS.

Best Varieties of Currants for the Amateur Grower, J. R. Cummins, Washburn.

Planting and Cultivation of the Currant for the Amateur, A. D. Leach, Excelsior.

Most Profitable Sorts of Currants for the Market Gardener, Wm. Lyons, Minneapolis.

WEDNESDAY MORNING SESSION—
Continued.

10:30 o'clock. Ten minutes intermission.

Planting and Care of Currants for the Market Gardener,
Frank Yahnke, Winona.

Profits of Currant Culture,
Wm. H. Brimhall, Hamline.

The Uses of the Currant in the Family,
Mrs. T. A. Hoverstad, Crookston.

GOOSEBERRIES.

The Houghton Gooseberry and its Competitors, A. M. Shepard, Minneapolis.

Culture of the Gooseberry,
M. C. Bunnell, Newport.

Insects that Ravage the Currant and Gooseberry, Prof. O. Lugger.

LIFE MEMBERSHIP FEE, $10.00.

This may be paid in two equal annual instalments.

Life Members are entitled to a file of back reports, a library in itself.

OUR LIBRARY.

Volumes in society library	686
No. of periodicals received regularly	30
No. of states sending State Experiment Reports	47

Donations of horticultural books to the library will be credited to the donor on the register and on the fly leaf of each book.

WEDNESDAY AFTERNOON SESSION.
2 o'clock.

General Subject—The Blackcap Raspberry.

Reports of Joint Nomenclature Commission, by Clarence Wedge, Chairman, and Prof. N. E. Hansen, Brookings, S. D., Sec'y.

The Owatonna Experiment Station at Short Range, Wyman Elliot, M'pls

NINE FIVE MINUTE PAPERS.

Improvements in the Blackcap Raspberry in the Last Quarter Century,
O. M. Lord, Minnesota City.

Planting the Blackcap Raspberry Field,
Dewain Cook, Windom.

The Cost of Bringing into Bearing an Acre of Blackcap Raspberries.
L. P. Lord, Owatonna.

Harvesting the Crop of Blackcap Raspberries, F. I. Harris, La Crescent.

3:30 o'clock. Ten minutes intermission.

Treatment of the Blackcap Raspberry Field during Harvest,
R. A. Wright, Eureka.

Putting the Raspberry crop on the Market, I. W. Wood, Markville.

What Shall be Done with the Blackcap Raspberry Patch after Harvest?
Mrs. A. A. Kennedy, Hutchinson.

Profits of Growing the Red and Blackcap Raspberries Compared,
C. W. Sampson, Eureka.

The Blackcap Raspberry in Glass,
Mrs. S. B. Green.

THURSDAY MORNING SESSION.
9 o'clock.

General Subjects—Annual Reports, and Vegetables.

President's annual address,
J. M. Underwood, Lake City.

Annual report of the executive board.
Wyman Elliot, Chair'n, Mpls.

Annual report of secretary,
A. W. Latham, Minneapolis.

Annual report of treasurer,
C. W. Sampson, Eureka.

Annual report of librarian.

(The library is at No. 207 Kasota Block, Minneapolis.)
A. W. Latham, Librarian.
E. A. Cuzner, Assistant Librarian

(The assistant has charge of the surplus reports stored at Pillsbury Hall, State University.)

Report of legislative committee,
Wyman Elliot, Chairman.

Report of Vice-Presidents,

(To be filed for publication without reading.)

E. H. S. Dartt, First Cong. Dist., Owatonna.
S. D. Richardson, Second Dist., Winnebago City.
Mrs. A. A. Kennedy, Third Dist., Hutchinson.
R. S. Mackintosh, Fourth Dist., St. Anthony Park.
Col. J. H. Stevens, Fifth Dist., Minneapolis.
Miss Jennie Stager, Seventh Dist., Sauk Rapids.

10:30. o'clock. Ten minutes intermission.

THURSDAY MORNING SESSION—
Continued.

TEN FIVE MINUTE PAPERS.

Selection of Varieties for the Vegetable Garden, J. E. Northrup, Minneapolis.

Cultivation of Squash in the Family Garden, J. S. Jerabek, Silver Lake.

The Farmer's Vegetable Garden, A. K. Bush, Dover.

A Vegetable Garden for the Village lot, E. A. Cuzner, Minneapolis.

Tools for the Vegetable Grower, Wm. Mackintosh, Langdon.

Potatoes in the Market Garden, Franklin De Cou, St. Paul.

Melons for Market, H. C. Ellergodt, Lanesboro.

What Kinds of Potatoes Have Proved Most Valuable? J. C. Walker, Rose Creek

My Method of Growing Tomatoes, Aug. Wittman, Merriam Park.

The Melon Peach and its Possibilities, Mrs. A. G. Long, Excelsior.

Renew your membership with the secretary.

THURSDAY AFTERNOON SESSION.
2:00 o'clock.

General Subjects—Election of Officers, Women's Auxiliary, Flowers, etc.

Reports of committees on president's address, award of premiums, etc.

Report of committee on ornamental list, F. H. Nutter, Minneapolis. L. R. Moyer, Montevideo.

Intermission of ten minutes.

3 P. M.—Annual Election of Officers.

Report of the Women's Auxiliary of the Minn. State Hort. Society, Miss E. V. White, Pres.

The Work of an Improvement Club, Miss Lucia E. Danforth, Sec'y Women's Auxiliary.

Town and Village Improvement, Mrs. Anna B. Underwood, Lake City.

Report of Minneapolis Mycological Society, W. M. Babcock, Minneapolis.

SEVEN FIVE MINUTE PAPERS.

What Flowers shall we Plant about the Home? Mrs. L. A. Danforth, Red Wing.

A Practical Plan for an Ordinary Home Yard. F. H. Nutter, Mpls.

Evergreens about the Farm Home. Roy Underwood, Lake City.

The Plant Window in Winter. Mrs. O. C. Gregg, Lynd.

Shade Trees for Ornament about the Home. L. R. Moyer, Montevido.

My Success with Garden Flowers. Mrs. C. O. VanCleve, Mpls.

Native Plants for Ornamental Purposes. Prof. D. Lange, St. Paul.

FRIDAY MORNING SESSION.
9 o'clock.

General Subject—Apple Seedlings.

Announce the Annual Session of the Women's Auxiliary of the Minn. State Hort. Society, at 10:00 a. m.

ELEVEN FIVE MINUTE PAPERS.

The Apple Seedling in the Development of a Local Pomology, Prof. S. B. Green, St. Anthony Park.

Selecting, Preserving and Planting Seed for Growing Apple Seedlings, R. H. Buttermore, Lake City.

Promising Apple Seedlings for Minnesota, J. S. Parks, Pleasant Mounds.

The Peerless and Its History, Geo. R. Miller, Richland.

Legal Protection for the Originator of a Seedling Fruit, A. B. Choate, Mpls.

Apple Seedlings of Merit in Northern Iowa. Clarence Wedge, Albert Lea.

10:30—Ten Minutes Intermission.

My Apple Seedling, J. H. White, Crystal.

The More Recent Minnesota Apple Seedlings of Value, J. S. Harris.

Does Experience Promise Minnesota a Hardy, Long-keeping Seedling Apple? E. H. S. Dartt Owatonna.

Wisconsin Seedling Apples of Value in Minnesota, A. J. Philips, West Salem, Wis.

The Prospective Value of Northwestern Apple Seedlings. Edson Gaylord, Nora Springs, Ia.

FRIDAY AFTERNOON SESSION.

2:00 P. M.

General Subject—The Minnesota Apple Orchard.

TEN FIVE MINUTE PAPERS.

The Legislature *versus* the Tree Shark,
H. M. Benton, Minneapolis
Selection of Site for the Orchard,
J. A. Howard, Hammond.
Fall Planting of the Orchard,
J. P. Andrews, Faribault.
Preparation for Orchard Planting,
E. Cooper, Adrian.
The Duchess Apple in Minnesota and How to Handle it,
E. H. S. Dartt, Owatonna.
The Advantage of Planting Home Grown Trees in the Apple Orchard,
F. W. Kimball, Austin.

3:30 o'clock—Ten Minutes Intermission.

Top-working the Minnesota Orchard,
D. F. Akin, Farmington.
Harvesting the Apple Crop,
C. W. Merritt, Homer.
Storing and Marketing the Minnesota Apple,
F. C. McMullen, Mpls Cold Storage Co.
My selection of varieties in an orchard of 1,000 trees, Wyman Elliot, Mpls.
The Value of Evergreens for the Apple Orchard, M. Penning, Sleepy Eye.

Unfinished Business.
Report of Committee on obituaries and final resolutions.
4:00 P. M.—Two minutes speeches by the members.
4:30 P. M.—Closing remarks by the president.

FRIDAY EVENING SESSION,

7:30 o'clock.

General Subject—Program by the University Farm School, arranged by Prof. S. B. Green, Horticulturist.

Music, papers, addresses and other features of interest will be contributed by pupils of the school.

To conclude with a stereoptican entertainment under the title of

WORK OF THE YEAR (illustrated).
Prof. S. B. Green.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place the first day of the meeting to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the articles exhibited. The articles exhibited must have been grown in Minnesota or manufactured from Minnesota grown products.

Each exhibit of fruit must consist of four specimens, except when otherwise noted.

No premium will be awarded on unworthy exhibits.

	3d. Prem.	1st. Prem.	2d. Prem.
APPLES AND CRABS.			
Collection	$3.00	$8.00	$5.00
Each variety exhibited included in the 1898 fruit list of this society or in the 1898 Minn. State Fair prem. list		.75	.50
Collection of seedlings	2.00	5.00	3.00
Seedling apple never having received a premium from this society, kept in cold storage		2.00	1.00
Seedling apple never having received a premium from this society, not kept in cold storage		4.00	2.00
GRAPES.			
Collection		3.00	2.00
Each variety exhibited included in the fruit list of this society for 1898 or in the 1898 Minn. State Fair premium list		.75	.50
PLANTS IN POTS.			
Collection of ornamental and flowering plants		5 00	3 00
Single rose in bloom		1.00	.50
Single geranium in bloom		1.00	.50
Single begonia in bloom		1.00	.50
Single carnation in bloom		1.00	.50
CUT FLOWERS.			
Collection of cut roses		2.00	1.00
Collection of cut carnations		2.00	1.00
Table bouquet		2.00	1.00
Basket of flowers		2.00	1.00
HONEY.			
Collection of comb honey, *ad libitum*		5.00	3.00
Collection of extracted honey, "		3.00	2.00

Dealers in horticultural implements and appliances are invited to place them on exhibition.

Secretary's Corner.

DEATH OF MRS. ANNIE BONNIWELL.—Late press dispatches announce the death at her home in Hutchinson, in November, of this most estimable lady. She had been out of health for some years, and last year did not attend our annual meeting, though prior to that for a good many years she had been regularly present. Her absence from our gatherings will be noted with sadness by the many friends she has made in our ranks. No particulars as to her death are at hand at the time of writing.

PROF. GREEN A SECRETARY.—A new honor has been thrust upon the professor by making him secretary of the society composed of horticulturists and botanists of the various experiment stations of the country.

DELEGATE TO N. E. IOWA HORT. SOCIETY.—Our society will be represented at the annual meeting of this society by Mr. J. C. Hawkins, of Austin, who is at present president of the So. Minn. Society. This meeting convenes at McGregor, Nov. 29, 30 and Dec. 1st.

HAVE YOU PAID YOUR MEMBERSHIP FEE FOR 1899?—With the programs for our annual meeting, recently sent out, went a card to be used in renewing membership in the society. You are urged to give this early attention. Fill out the card and enclose with one dollar to the secretary.

DELEGATE FROM IOWA STATE SOCIETY.—Elmer Reeves, of Waverly Ia., will represent the state society at our coming meeting. Mr. Reeves is a nurseryman and especially well known to us for many years as secretary of the Northeastern Iowa Society. An engraving of him and a short sketch of his life was published in our monthly two or three years since.

THE ANNUAL MEETING OF IOWA STATE HORT. SOCIETY.—This meeting will be at the rooms in the Capitol, at Des Moines, Dec. 13-16. The program contains eighty-six numbers, with enough variety to satisfy any one. The committee preparing it have adopted in a measure the plan of preparing a number of five-minute papers on one topic. It will give them satisfaction, as it has us.

ANNUAL MEETING N. W. IOWA HORT. SOCIETY.—The program for this meeting, which takes place Dec. 6-8 at Carroll, Ia., is received, and it is a good one. We have never to the writer's knowledge had a delegate from that society at our annual gatherings, but we surely ought. A letter from Vice-President M. E. Hinkley gives as a reason for not coming that their meeting is at the same date as ours.

BRING YOUR FRUIT TO OUR MEETING.—There will be the usual show of fruit on this occasion, much of which is already in cold storage in Minneapolis, but do not forget to bring specimens of anything you may have keeping in your cellars to help out the exhibition. More space will be allotted to this exhibit than heretofore, and there will be room for all. Bring especially the seedling apples.

THE WOMEN'S AUXILIARY TO THE MINNESOTA STATE HORTICULTURAL SOCIETY.—The conception of this organization, which was perfected at the last summer meeting of our society, originated with Mrs. Anna B. Underwood, the wife of our honored president, or with her husband or with both, the writer does not know which. The ultimate purpose is to make the women helpful in the work of the state society, especially in the development of certain fields in which their sex has a more natural interest, and these will occur to any reader. They will hold a meeting during the session of the state society, as noted in the program, and hope to get their work in shape to bring about practical results. The membership is, of course, open to all women, and they are urged to be present on Friday forenoon at 10 o'clock (on Dec. 9th), the time set, and identify themselves with the organization. Mrs. Underwood will be very glad to receive communications from any one in the meantime, or answer any questions in regard to the work of the society, and suggestions as to the best methods and kind of work to be done will be especially welcome. Address her at Lake City, and don't forget to come to the meeting.

GREEN'S "FORESTRY IN MINNESOTA."—This new work, by Prof. S. B. Green, to which reference was made in the November number, is now completed and ready for distribution. Paper covered copies can be had free upon application to the secretary of the forestry association, Geo. W. Strand, of Taylor's Falls, Minn., though it is likely applicants will be expected to advance the postage, 5 cents. The book is of the same size as the works on fruit and vegetable growing by the same author, and contains 312 pages. The first 126 is devoted to a practical treatise on the art of forestry, covering almost every branch of the subject in a very complete way; the remainder contains full descriptions of the trees and shrubs growing in Minnesota, with many apt illustrations showing leaves, buds, flowers and fruit of the varieties being considered. While prepared especially for the class room at our State Agricultural College, the work is not too technical for practical use by any one, and is as well adapted to the prairie as to the forested regions of the state.

In fact, it is *too good* a book to *give away*, and in order that each of our members may have a copy in good shape for preservation and reference we have had a quantity bound in strong cloth, for sale at 50 cents each, or they will be given to our members as premiums for securing new members to the society. A few minutes taken to secure a new member will be doubly repaid by a handsome copy of this very useful book.

Annual Meeting.

December 7-10, 1897.

JOURNAL OF THIRTY-FIRST ANNUAL MEETING OF MINNESOTA STATE HORTICULTURAL SOCIETY, HELD IN MINNEAPOLIS, AT THE COURT-HOUSE, DECEMBER 7-10, 1897.

(For program of this meeting see page 481, Report of 1897).

The annual meeting of the Minnesota State Horticultural Society convened in the rooms of the county commissioners of Hennepin county, at 10 o'clock, on the morning of December 7th.

TUESDAY FORENOON SESSION.

The meeting was called to order by President Underwood, who opened the meeting with the following brief remarks:

Fellow Members of the Minnesota State Horticultural Society: —It is necessary to again take up our work for another year. For the thirty-first time we commence the annual meeting of the Minnesota State Horticultural Society. I need not say, perhaps, to me it is a great pleasure to meet you here, to meet the old friends I have not met for a year, and to make new acquaintances. I wish you to observe this rule in our society, and that is, while you are with us I want you to feel perfectly at home and feel as though you were a part of the association and free to take an active part in all of our deliberations. We like to have every one feel perfectly at home here and free to express themselves on all topics we may have under consideration, and free to impart any information they may possess that may be of benefit or of interest to any of the other members. I think this is the spirit that has always prevailed, although I have somehow thought that sometimes people came into the meetings who felt a little diffident about making themselves prominent in our discussions, and they did not know how much good they might do by making themselves a little more familiar.

We have not a very large representation with us this morning, but I trust they may increase in numbers as the meeting goes on, and I trust we shall have a good many ladies to take part with us, and that they will feel at home with us, and feel as though they had a perfect right to take a prominent part in our society. I do not know

but it would be the proper thing for the men to come up to the secretary's desk and pay the fees for the ladies who do the talking. The men think they have done their part when they have paid their fee, but if they paid for the ladies they might help them out to a considerable extent, perhaps, by helping the men do the talking; they are used to it and, as a rule, are good deal better talkers than the men.

Before taking up the program, I will appoint a committee on credentials, consisting of C. L. Smith, C. W. Sampson and Clarence Wedge. I wish all delegates from other societies would make themselves known to the secretary here, and also that visiting members from abroad would make themselves known to us, so that they may be reported by the committee on credentials. Let me suggest while I think of it, as delegates may come in after the first session or, perhaps, tomorrow, I hope the committtee on credentials will take pains to see that they are found out and made to feel at home, and the attention of the president and secretary called to their presence and I also hope that our visiting friends and delegates will take an active part in the work of the society during this meeting.

The program for this morning invites your attention to the consideration of the subject of red raspberries. As you will see by the program, we have aimed at the policy this year to give careful and special attention to a special subject, and exhaust that subject as far as possible. We do not expect to entirely exhaust any subject, but to take it up and discuss it so thoroughly that when we get through with it we shall feel as though we had learned something. For this purpose we have arranged for five minute papers, and as far as possible we want to confine the reading of these papers to five minutes, because we want to have time to thoroughly discuss the several papers that are to be presented here. As we get to work you will see the plan of work we have mapped out, and I trust you will be prompt in taking it up. Immediately after a paper has been read I would like to have you take up the discussion; if you have any question to ask or any thought to suggest or any infofmation to impart on the subject, I wish you would do so promptly and briefly, so that we may have short and sharp discussions on every paper, and then after the whole subject is exhausted and all the papers have been read we will have a general discussion. Any thought pertaining to the particular paper under consideration that occurs to you, you will be at liberty to bring out at that time.

The first paper on this subject will be presented by Mr. C. W. Sampson, "The Best Three Varieties of Red Raspberries for Market." C. W. Sampson, Eureka. (See index).

Discussion.

The President: Can any one else name the best three varieties? You understand this has reference only to berries for market. If there are no further suggestions to make on this topic, we will take up the subject of the best three varieties for home use, by Mr. Spickerman.

"Best Three Varieties of Red Raspberries for Home Use." C. W. Spickerman, Excelsior. (See index).

Discussion.

"Soils Most Suitable for Red Raspberries and Their Preparation." L. H. Scofield, Bay Lake. (See index).

Discussion.

The President: If there is no further discussion on this subject, we will take up the next paper by Mr. Wright.

"Methods of Originating New and Propagating Old Varieties of Red Raspberries." R. A. Wright, Eureka. (See index).

Discussion.

"The Native Everbearing Red Raspberry." E. A. Bromley, Minneapolis. (See index).

Discussion.

TUESDAY AFTERNOON SESSION.

We have a paper on "Red Raspberries in Minnesota" by Wm. Lyons. We had this forenoon the subject of red raspberries under discussion, and as we did not quite finish that topic we will do so at this time.

"The Red Raspberry in Minnesota." Wm. Lyons, Minneapolis. (See index).

Discussion.

Mr. Brand: I would like to give notice of some proposed amendments to the constitution.

Mr. Brand then gave notice of the following proposed amendmendments to the constitution:

NOTICE IS HEREBY GIVEN of amendment to Articles 4 and 10 of said Constitution, to be submitted on the 9th day of December, 1897, as follows, to-wit:

Amend the first sentence of said Article 4 by striking out the word "Congressional" in the second line of said Article, and insert in lieu thereof the word "Judicial"; also strike out the word "six" in the third line of said Article and insert in place thereof the word "seven"; also add to the third sentence, after the word "meeting," the words, "beginning at 2 o'clock;" also amend the fourth sentence by striking out the words, "the three years immediately preceding," in the third line of said sentence, and insert in place thereof the words, "one year previously;" also amend the seventh sentence of said Article so that the term of office of as near as may be one-third of the Board of Directors shall expire each year; also amend the next to the last sentence of said Article by striking out the word "and" in the first line after the word "president," and insert the words "and treasurer," after the word "secretary" in said line; also amend sentence five of said Article so that it will read as follows:—

"The President and Vice-Presidents shall hold their office for one year, and the Treasurer shall hold his office for three years."

Article 10.--Amend the seventh sentence of Article 10 by inserting after the word "society," in the first line of said sentence, the words "After the adjournment of an annual meeting."

O. F. BRAND.

The President: We will now listen to the report of the committee on credentials.

The committee on credentials reported the following delegates entitled to seats in the convention:

A. Bryant, of Princeton, Ill., vice-president Northern Illinois Horticultural Society, to represent the Illinois State Horticultural Society.

W. A. Burnap, delegate from the N. E. Iowa Horticultural Society.

George H. Van Houten, Lenox, Ia., Secretary Iowa State Horticultural Society, to represent that society.

M. J. Wragg, delegate from Iowa State Horticultural Society, Waukee, Iowa.

The President: We are glad to welcome these delegates to our society. Some of you are here for the first time, but we trust you will feel just as much at home as though you had been with us every year. We would like to hear a few words from our visiting delegates, and I take pleasure, ladies and gentlemen, in introducing to you Mr. Bryant, of the Illinois State Horticultural Society.

Mr. Bryant (Illinois): Mr. President, Ladies and Gentlemen: I wish to say that my credentials are lacking, as our secretary has been a little slow in forwarding them, but I presume they will be here before the meeting is over. I am very happy to meet with this society. We have had a number of delegates from your society, but I have never had the pleasure of meeting with you before.

The President: I now have the pleasure of introducing Mr. W. E. Burnap, from the Northeastern Iowa Horticultural Society.

Mr. Burnap (Iowa): If there was any one thing that we boys who used to wear brass buttons admired, it was courage. It was not that courage that used to induce the boys to make a reckless dash and get lost so it would take a detail of men to find them, but the courage that kept them in the field, though their companions dropped by their sides; and when the lines wavered and almost broke we would pass the word along the line, "Steady, boys, steady, we will thrash them yet." Our courage was intensified when we were in the same line of battle, because we knew when the front line was whipped or dropped out we would have to take their places. I feel a good deal that way now in the horticultural battle that we are

fighting. Now, we that are in the second line of battle down there in Iowa have a great deal of admiration for your courage up here in Minnesota. We have a great deal of admiration for your persistence and courage, and I am pleased to say that we appreciate the work that you are doing here. (Applause).

The President: I will now introduce to you Mr. Geo. H. Van Houten, Secretary of the Iowa State Horticultural Society.

Mr. Van Houten (Iowa): Mr. President, I would prefer very much to take a back seat, and rather a low one at that, so as not to become conspicuous. They do not allow me to talk at home. I brought up Mr. Wragg, and he will do the talking. I am not a talker myself, and I am so accustomed to taking down what is said at home that I got out of the habit of talking, so you will please excuse me.

Mr. President: I will now introduce to you Mr. M. J. Wragg, from the Iowa State Society. Mr. Wragg has been given a reputation as a talker, and we shall be pleased to hear from him.

Mr. Wragg (Iowa): Mr. President, Ladies and Gentlemen: I am sorry that my friend Van Houten is so affected with diffidence; a man who has seen all sides of the globe to make the assertion that he has nothing to say seems rather strange. I am sorry that my reputation is such that he speaks of me as a "talker." I can only say that I am much gratified to be with you. I was much gratified when I was selected as a delegate by our society to represent them here. It has been with much pleasure for years past that I have read your reports. I keep a copy year after year in my library; I always have the Minnesota and Wisconsin reports there. I always try to get the Illinois and Nebraska reports, but I read your reports with the greatest interest. I am interested in your work; it is along the line of progressive horticulture. We were glad to see when we commenced the work of cross-hybridization, that your experience in that line was valuable to us. We have met with many disappointments, but we have courage. We live, as Dr. Powell wrote us to say, in the land of the big red apple, where we load train loads of them and are not afraid to go into the markets of the world; we are even shipping train loads of apples to New York. Ladies and Gentlemen, I thank you. (Applause.)

The President: Now we have some valuable work to take up on the general subject of apples. The first paper we have is by Mr. Akin of Farmington, and as Mr. Akin is not present, I will ask the secretary to read it.

"The Most Profitable Five Apples for Minnesota." D. F. Akin, Farmington. (See index).

Discussion.

The President: Mr. Cummins will now read a paper.

"The Most Profitable Five Crabs and Hybrids for Minnesota." J. R. Cummins, Washburn. (See index).

Discussion.

The President: Mr. Harris will read the next paper.

"The Seedlings of 1897." J. S. Harris, La Crescent. (See index).

Following Mr. Harris' paper, Mrs. D. Minor of Minneapolis, favored the audience with a vocal selection, entitled "The Prince."

The following paper was then read by the writer: "Methods of Propagating Apple Trees Described and Compared," S. D. Richardson, Winnebago City. (See index).

The President: We will now take up the subject of girdling by Mr. Dartt.

"Girdling to Produce Early Bearing." E. H. S. Dartt, Owatonna. (See index).

Discussion.

The President: Our next paper is on the subject of mulching by Mr. Dewain Cook.

"Cultivation versus Mulching for the Orchard." Dewain Cook, Windom. (See index).

Discussion.

"What Place has Grass in the Orchard?" A. K. Bush, Dover. (See index).

Discussion.

"Limit of Age in a Minnesota Orchard and How to Increase It." Wm. Somerville, Viola. (See index).

"A Review of Apple Blight." Clarence Wedge, Albert Lea. (See index).

Discussion.

The President: The next paper is on a subject we are all interested in, as we all still have in mind the fight we made in the| legislature last winter. Prof. Lugger will now read a paper on the San Jose scale.

"An Enemy We Dread—the San Jose Scale." Prof. Otto Lugger, Minnesota Experiment Station. (See index).

The President: We have not time to prolong the discussion on these subjects, as we have had a long session, and I do not want to make it too tiresome for you, but this is an interesting subject, and perhaps we will have time to take it up and discuss it somewhat at our next session.

President Underwood then appointed the following committees:

On Awards: Grapes, R. A. Wright; Apples, Prof. S. B. Green; Honey, E. R. Pond; Flowers, Mrs. Jennie Stager.

President's Address: F. W. Kimball, D. T. Wheaton and A. K. Bush.

Obituary: J. S. Harris, S. D. Richardson and E. H. S. Dartt.

Final Resolutions: Clarence Wedge, J. W. Murray and T. T. Smith.

The President: If there is nothing more to come up this afternoon, we will now stand adjourned until tomorrow morning at nine o'clock.

WEDNESDAY FORENOON SESSION.

The President: There are some subjects here left over from yesterday that, perhaps, we ought to give some attention to. There is the subject of top working, you might want to take that up a little while, and also the report of the committee on nomenclature and seedling fruits. I presume that committee is ready to report.

Mr. Harris submitted the following report of the committee on nomenclature.

"Report of Committee on Nomenclature and Catalogue." J. S. Harris, La Crescent. (See index).

Discussion.

Mr. Harris: Mr. President, I move that we strike the word "Greening" out from the name of the variety known as Patten's Greening, and call it the Patten.

Mr. Van Houten (Iowa): Mr. President, I concur in this action; I think it is the proper thing to do to drop the name "Greening" and adopt the name "Patten."

The motion was duly seconded and being voted upon unanimously prevailed.

The President: We will now take up the next topic in regard to "Spraying the Orchard." Has any one a word to say in regard to the advantages and disadvantages of spraying the orchard? Our friends from Iowa and our "sucker" friends can take part in this discussion and ought to be able to tell us something. (See index).

The President: We will now listen to the report of the committee on seedling fruits.

"Report of Committee on Seedling Fruits." J. S. Harris, La Crescent. (See index).

Discussion.

The President: We will now take up the reports from local societies.

Mr. Gibbs: We would be very much gratified if we could

take up the subject of top-working, and I think we are desirous of hearing from Mr. Underwood on this subject.

"The Philosophy of Top-working and Influence of the Stock." J. M. Underwood, Lake City. (See index).

Discussion.

The President: We will now take up the reports of local societies. I will call on Mr. Wedge, who is secretary of the Southern Minnesota Horticultural Society.

Mr. Wedge: Our society has not yet had its meeting this year, and I believe our last report was given at the last meeting. I will only say that our society is in a flourishing condition, and we have doubled our membership during the past year.

"Report of Dover Horticultural Society." A. K. Bush, Secretary, Dover. (See index).

At this point Mr. Roy Underwood entertained the audience with a barytone solo, entitled "King David."

"The Foreign Tree Dealer as an Educator." C. L. Smith, Minneapolis. (See index).

Discussion.

The President: I hardly think we could improve on the treatment Mr. Smith has given the subject; and as our time is limited I think we had better pass on.

"Land of the Big Red Apple." J. S. Harris, La Crescent. (See index).

Mr. C. L. Smith: Mr. President, we are getting way behind on our program. I move that the proposed amendments to the constitution be referred to a committee appointed by the chair, who shall report on them as soon as they are ready.

The motion was seconded, and being voted upon unanimously prevailed.

The chair appointed as members of such committee Messrs. C. L. Smith, L. R. Moyer, A. K. Bush, O. M. Lord and F. W. Kimball.

The President: This committee will, as soon as convenient, take this matter under consideration, and Mr. Brand, who proposed the amendments, can meet with the committee, so that the matter can be fully discussed with a thorough understanding on either side.

The noon hour has arrived, and we will now adjourn until two o'clock this afternoon.

WEDNESDAY AFTERNOON SESSION.

The President: In this morning's program we had the report of the committee on fruit list. This afternoon we have left over a paper on "Nuts for Minnesota," by Hon. H. E. Van Deman, of Va. Then we have the reports of superintendents of trial stations. Prof. Green prefers not to make a report at this time, as he will hand in a written report for publication, and it will save considerable time, as we can at once get to our afternoon's program, which is very interesting and necessary to take up. If there are others who have reports to make on trial stations we will take them up now. If not we will take up the subject of the afternoon, "Plums and Grapes." I will first call on Mr. Doughty.

"Best Three Varieties of Plums for Home Use and Market." J. Cole Doughty, Lake City. (See index).

The President: We will now listen to a paper by Mr. Lord, the plum man.

"Varieties of Plums for Home Use and Market." O. M. Lord, Minnesota City. (See index).

Discussion.

The President: We will next have a paper on the propagation of plums by Mr. Nordine.

"Methods of Propagating the Plum." John Nordine, Lake City. (See index).

Discussion.

Mrs. S. J. Beardsley and Miss Hallie Latham enlivened the occasion by the rendition of a vocal duet, entitled "Alabama Coon,"

Mr. Dartt: I understand that the reports of the experiment station have been passed by. I am here with my report and am ready to report. The station that I have is the only paid station in the state, except the central station, and I have taken pains to review the work of the station to some extent. The paper is not lengthy, and it refers to some of the matters that were passed over yesterday, and I think probably a majority of the members here would like to hear the report. If so, I will ask the secretary to read it.

The President: It was the request of the society that we take up the discussion of the subject under consideration for this afternoon, and I think we had better finish this topic first, and then we can take up Mr. Dartt's report.

"Plums on the Village Lot." L. R. Moyer, Montevideo. (See index).

"Planting and Cultivation of the Plum Orchard." Oliver Gibbs, Jr., Minneapolis. (See index).

Discussion.

The President: We have with us Prof. Goff, of Wisconsin, who represents the Wisconsin society. He spoke to us this afternoon on this subject of plums. We would like to hear from him the summing up of this plum question. (See index).

The President: The plum question has now been pretty thoroughly discussed, and I think if there is no objection, before taking up the next subject on the program we will take up the reports of trial stations, such as may be here to make a report. I have been requested to sing "The Monks of Old," and as it might relieve the audience to rise I will ask you to do so while I sing.

Mr. Underwood then sang "The Monks of Old," which was highly appreciated, judging from the applause which followed.

Report of Owatonna Trial Station. E. H. S. Dartt, Owatonna. (See index).

Discussion.

Report of Montevideo Trial Station. L. R. Moyer, Montevideo. (See index).

Report of Sauk Rapids Trial Station. Mrs. Jennie Stager, Sauk Rapids. (See index).

Report of Committee on Fruit List. (See index).

Mr. Wedge: Our report is very short as the list remains practically unchanged, but we would like to have an expression by the society on the various kinds named in the list, or in other words, a vote taken, which can all be done in ten minutes.

The President: We will take it as the sense of the meeting that you would like to have this expression taken at this time.

Mr. Wedge: It is not the idea of the committee to get only the expression of those who have tried the fruit on their own grounds, but also of those who have knowledge of its being tried elsewhere in their localities, and then also get an expression from those who would recommend the different varieties.

On motion of Mr. J. S. Harris, Lyman's Prolific crab was placed on the list of crabs for trial.

The President: We will now take up our regular program again, and this brings us to the subject of "Grapes." The author of the first paper is not present, so I will call on Mr. Leach.

"Best Five Grapes for Market." A. D. Leach, Excelsior. (See index).

Discussion.

The President: We will now listen to a paper by Dr. Frisselle.

"Fall Pruning the Vineyard." Dr. M. M. Frisselle, Eureka. (See index).

Discussion.

"The Grape in Domestic Economy." Mrs. D. F. Akin, Farmington. (See index).

"My Home in a Vineyard." Mrs. Isabella Barton, Excelsior. (See index).

Discussion.

The President: We have with us a representative of the press, Mr. S. M. Owen, and we would like to hear whether he has any word of comfort or cheer that he can offer the horticulturists of Minnesota.

Mr. Dartt: Or any kicks that he has to bestow. (Laughter).

Hon. S. M. Owen: What can I say to you? They say I have got lots of time. I did not come here to teach you anything. I cannot do that in your line. Perhaps there are some things I know a little more of than you do, but so far as fruit growing is concerned I would like to sit here as a student, and listen to those little spats and differences of opinion you sometimes indulge in. I like those little inoffensive thrusts of my friend Dartt, because it does not hurt me, and I know he enjoys it. I like to listen to the knowledge and experience you have gained during the past year, and I like to see you get together in a social way, and I like to hear you criticize each other in a friendly way in relating your various experiences at these annual meetings, and I can imagine how pleasant it is for you to come together, you who are of one thought, who are pursuing one object, who are of one faith in regard to this great question of fruit growing in this great state, and I can see very plainly that you must enjoy these meetings in a social way. As I sit here and listen to you, and as I pass through this exhibit you are making here and contrast the meetings, contrast the exhibit, contrast your annual report with that little one of some thirty odd years ago, merely a little pamphlet, when I now look at the present report, which is a large book of horticultural literature, I can see by the growth of your report what you have been doing, if not by the other things I have seen here today. When I first knew of your society you had a little handful of fruits, your exhibit did not cut any figure at all, and what we did see were some little frail things that had been coddled through the fall and winter that you might show them here at this exhibit. The exhibit here today tells the story of your achievements. It tells of the ambition, the perseverence, the faith and the labor you have put into this business of horticulture, and any man, I care not who he is, who recalls these things, and

then thinks of the growth and development of the fruit industry of this state, must express his admiration for the work that has been and is being accomplished in the horticultural development of our state. I do not say this to flatter you, but I say it because I mean it; I say it because I want you to understand that I am expressing the sentiments of thousands of people in this state. The horticultural society of this state stands away up high in their estimation as a society made up of earnest, intelligent men and women who have taken up a cause and have succeeded in developing an industry that has been not only to their advantage, but it is to the advantage of the entire commonwealth, an advantage to the people as far north as fruits can be grown. Your president said I might possibly have a word of cheer to speak to you tonight, and, really, you do need to be cheered. The faith that is in you is justified by your achievements. I can conceive of nothing more cheering to the human soul than to have that consciousness that in spite of all your vicissitudes, in spite of the uncongeniality of your climate, in spite of the disposition manifested by nature in your horticultural work, you have done it so intelligently and so effectively that now the people of the entire state are ready to rise up and call you blessed. I can assure you, gentlemen and ladies, that by what you have accomplished you have been building monuments in the hearts of your countrymen. (Applause).

The President: We appreciate, I assure you, your kind words of encouragement, and we are always glad to have you with us. We all appreciate good company, and we are always more than pleased when we can have our friend Owen with us, and also other representative men, men who, perhaps, are not so strictly in our work as we are ourselves, but still their hearts and sympathies are with us in what we do. I always feel that we are fortunate when we can have our friend Pendergast with us, and I am sure those of you who have not made his acquaintance will be benefited by having him say something to us. (Applause).

(For Prof. W. W. Pendergast's remarks, see index).

The President: It is getting somewhat late, and as our program is finished we will now adjourn until 9 o'clock tomorrow morning.

THURSDAY FORENOON SESSION.

The President: As Dr. Frisselle, who has the first number on the program this morning, is not present, we will take up the subjects immediately following, and the first is the President's annual address.

"President's Annual Address." J. M. Underwood, Lake City. (See index).

On motion of Judge Moyer the report of the president was referred to the committee on the president's address.

"Annual Report of Secretary." A. W. Latham, Minneapolis. (See index).

On motion of Mr. Brand it was decided to refer the report of the secretary to a committee of three.

The chair appointed as members of such committee Messrs. O. F. Brand, S. D. Richardson and A. K. Bush.

"Annual Report of Treasurer." A. H. Brackett, Long Lake. (See index).

On motion of Mr. Brand the treasurer's report was referred to committee on secretary's report.

The President: The reports of the secretary and treasurer have been audited by the executive committee and have already been passed upon by them, but it is all right and proper for any other committee from the society to take them up and compare them to see that they agree.

"Reports of Vice-Presidents." First Congressional District, E. H. S. Dartt, Owatonna. (See index).

Second Congressional District, S. D. Richardson, Winnebago City. (See index).

Third Congressional District, Mrs. A. A. Kennedy, Hutchinson. (See index).

The President: This concludes the reports of the vice-presidents, and now Dr. Frisselle is here—we will listen to his paper.

"How Can We Increase the Interest in Horticulture?" Dr. M. M. Frisselle, Eureka.

The President: We will at this time listen to the report of the committee appointed to consider the proposed change in constitution.

The secretary then read the following report submitted by the committee:

"Your committee appointed on the revision of the constitution beg leave to report that the treasurer be made a member of the board, *ex-officio*, but the rest of the amendments be omitted at this time. But we would earnestly recommend that this society at this meeting elect a committee of five on revision of the constitution, which committee shall through the society's publications invite all members to offer suggestions, and said committee shall report their conclusions to this society on the first day of the next annual meeting.

C. L. SMITH,
A. K. BUSH,
O. M. LORD.
F. W. KIMBALL.

Mr. Lord: Mr. President: I move the adoption of the report of the committee.

Mr. Elliott: I was busy at the time and not in the room, I would like to hear that proposed change read again.

The secretary then again read the proposed change in the constitution.

Prof. Green: Why is it intended to inerease the board? I have no objection to having the treasurer on the board, but I would simply like to know why it is thought necessary to increase the number of the board?

Mr. Harris: I think perhaps one reason was that at present there are eight members on the board, and by the addition of another one it would make an odd number, which might sometimes be desirable.

Mr. Collins: I move that before we take a vote on this report it be divided so that we can take action on part of the report and not all at one time.

An animated discussion upon the purport of the proposed changes followed.

Mr. Wedge: I move that this whole question be indefinitely postponed.

The motion was seconded by Mr. Richardson and, being put to a vote, prevailed.

Mr. Bush: I move that this society express itself as heartily disapproving of the spirit that is manifested in the presentation of these proposed changes in the constitution, and that we heartily approve of the official administration of the affairs of this society.

The motion was seconded by Mr. Lord, Mr. Kimball, Mr. Murray and others, and being put to a vote prevailed without a dissenting voice.

The President then declared the meeting adjourned until two o'clock.

THURSDAY AFTERNOON SESSION.

The President: The first thing this afternoon will be to finish this morning's program, and I will at this time call for Mr. Thornber's paper.

"Problems Confronting the South Dakota Fruit Grower." Walter S. Thornber, Brookings, S. D. (See index).

Discussion.

The President: We will now listen to a report from Mr. Lord as delegate to the Northeastern Iowa society.

"Report of Delegate to Northeastern Iowa Horticultural Society." O. M. Lord, Minnesota City. (See index).

The President: The time has now arrived for holding our annual election of officers, but before we proceed to that we will listen to a vocal solo by Mrs. R. A. Latham, "Then You'll Remember Me."

Mrs. R. A. Latham entertained the audience with an artistically rendered selection.

The election of officers was proceeded with, Mr. R. S. Mackintosh and Mr. W. L. Parker acting as tellers, the election resulting as follows:

For President, there were 158 votes cast, of which J. M. Underwood received 116, and O. F. Brand received 42.

For member of the executive committee for three years, Mr. Wyman Elliot received 72 out of 78 votes cast, and Mr. J. S. Harris received 73 out of 75 votes cast.

The complete list of officers elected is as follows:

President—J. M. UNDERWOOD, - - - - - - - Lake City
Vice President, 1st Cong. Dist.—E. H. S. DARTT, - - Owatonna
" " 2nd " " —S. D. RICHARDSON, Winnebago City
" " 3rd " " —MRS. A. A. KENNEDY, Hutchinson
" " 4th " " —R. S. MACKINTOSH, St. Anthony Park
" " 5th " " —Col. J. S. STEVENS, - Minneapolis
" " 6th " " —MRS. JENNIE STAGER, Sauk Rapids
" " 7th " " —J. O. BARRETT, - Brown's Valley
Treasurer—C. W. SAMPSON, - - - - - - - - Eureka
Members of the Executive Board for three years—WYMAN ELLIOT, Minneapolis; J. S. HARRIS, La Crescent.

The President: We have with us Representative Geo. M. Laing, of Windom. We would like to have him say a few words to us. We all know he is a good friend of ours, and I am sure you will be glad to make his acquaintance. (Applause).

Mr. Geo. M. Laing: Mr. President, this is an unexpected pleasure, and it is unexpectedly that I am here; I had a little business with the sheriff. (Laughter). As I came up stairs I met Mr. McGinnis going out, and he told me you were in session here. I supposed you were in session in St. Paul. I read in the papers that you were having a meeting, and I inquired in St. Paul where it was held, but nobody seemed to know anything about it. Your president says I am a friend of the horticultural society, and last winter in the legislature I did fight for the publication of your report. The legislature had an economical streak at one place, and they were trying to strain at a gnat and swallowing the camel; they were trying to cut off the publication of the most important report in the state of Minnesota. (Applause). I think they had better stop the printing of the treasurer's report, so far as the general public is concerned, and publish this horticultural report, because it is of the greatest interest to the farmers, and not only to the farmers, but to

the residents of villages throughout the state. There is not a hamlet in the whole state that is not interested in the reports you are sending out. I consider them the most important towards building up the most successful interest in the state of any reports that are sent out by the state, and I was very glad to do what I was able to do towards having the publication of your reports continued. (Applause).

Mr. Van Houten, (Iowa): Mr. President, Ladies and Gentlemen: I do not know that I shall appear before you again, and I wish to take a few moments of your time to speak upon a matter which I wish to bring to your attention. Before speaking about the matter in question I desire on behalf of myself and Mr. Wragg, who is too modest to speak in his own behalf, to thank you for the many courtesies you have extended to us. We have been very agreeably entertained, and we are very grateful for all you have done for us. We hope to see some of you at our Iowa horticultural meeting next Tuesday, also at the meeting of the Southwestern society, which meets at Glenwood a week from next Tuesday.

The educational matter I desire to speak about is this: There has been for some years an effort made on behalf of the horticulturists and agriculturists to get up a reading circle on horticultural and agricultural topics. We have now the Missouri Horticultural Society and some others interested in this work, and as the lecturer of the Iowa State Grange I am authorized to act on behalf of the state grange. We also have the support of the Iowa Agricultural College, and also hope to have the co-operation of the Iowa society, which meets next week, and we hope to have the help of Minnesota. We must have Minnesota, Iowa, Missouri and Nebraska, and later we hope to get Illinois and other states. If you desire to co-operate with us in this idea, we shall be very much pleased. We propose to put books treating on those topics in the homes of the people in the various states, and in this way we hope to do a great deal of good for horticulture, and by-and-by the people will realize the benefit of it to themselves in an educational way. I, as one of the agricultural editors of the state of Iowa, am bringing this matter before the people, and I know I have the hearty co-operation of the other editors, who feel as I do about the matter, and we must get the assistance of the editor and printer in general, as our success depends upon it. I do not propose to take up any more of your time on the matter, but I do hope we may interest you and the others in this work. The interest created in the horticultural development will be of inestimable value. (Applause).

The President: We will now pass on to our regular program, and take up the subject of "Flowers."

"The Farmer's Flower Garden." Mrs. Anna B. Underwood, Lake City. (See index).

"Some Old Fashioned Perennials and Their Care." Mrs. A. A. Kennedy, Hutchinson. (See index).

"A Few of the Newer Garden Flowers." Miss Emma V. White, Minneapolis. (See index).

Mr. Roy Underwood enlivened the occasion with an excellently rendered baritone solo, which elicited generous applause.

"Native Minnesota Flowers Worthy of Cultivation." Miss Sara M. Manning, Lake City. (See index).

Discussion.

"Hints on Locating Flower Beds about the Farmer's Home." Mrs. Jennie Stager, Sauk Rapids. (See index).

"Shrubs for Farm Home Decoration." Roy Underwood, Lake City. (See index).

The President: We have the pleasure of having a very attentive listener, in the person of Major Wilcox, of the Northwestern Farmer, and it has been my intention to invite the members of the press to take a prominent part in our program and for that reason, as we have a little time, we would like to hear from Major Wilcox. Whether it be a word of criticism or anything he may have on his mind, we would like to hear from him at this time. We want our friends to become acquainted with the men who are our best allies in desseminating the science of horticulture in the state of Minnesota. (Applause).

Major Wilcox: Mr. President, I have very little to say, and I hardly think it is fair to call me up at this late hour when everybody wants to go to supper. I have nothing practical to say to a body of this kind in the line of horticulture, and I do not think it would become me to talk against time. Therefore, if you will excuse me I will say no more.

The President: As Mr. Elliott was not in the room when his turn came on the program, we will listen to his paper now.

"Sweet Peas in Minnesota and Their Improvement." Wyman Elliot, Minneapolis. (See index).

The President: We have with us a gentleman who is secretary of the State Agricultural Society, and this last spring, or about a year ago, you will remember, I was induced to become identified more closely with that society by being elected a member of the board of management, and I have been very fortunate in having made the acquaintance of Mr. E. W. Randall, and perhaps it has been fortunate for this society, in that my assocociation with him has helped, I trust, to interest him in our society and our work, as he has been with us at a number of our meetings, and is with us at the present time. We will be glad to hear from him as to how

he looks upon the relation of horticulture to agriculture, or any other topic he may see fit to speak upon. (Applause).

Mr. Randall: Mr. President and Members of the Horticultural Society: I think your worthy president is given to magnifying the work performed by the secretary of the agricultural society, and possibly he has forgotten the amount of work he did himself at the last state fair. When he was elected it was said that another horticulturist had been added to the board, and there was an intimation that the new acquisition would be of but little use. He was assigned the dairy department, and afterwards was given the management of the police, and we found that he was just as capable in those lines as he is in horticulture. He is an expert dairyman, and when you have a little time to spare I think it would be well to ask him to relate his experience in dairying, teaching calves how to drink, etc. (Laughter). I was not expecting to be called upon; I have no paper prepared and no speech to make. A year ago I read a paper at your meeting. If I had that paper here I would like to repeat one of the paragraphs which it contained. (Sec'y Latham: I have it here). I may be sorry now that I called for it. (Laughter). This is a repetition of what I said about horticulture at your meeting a year ago. (Here Mr. Randall read a paragraph from an address delivered at the last annual meeting and found on page 279 of the 1897 Annual Report, the paragraph referred to beginning at the top of page 281).

The exhibit this year I think was the best and largest ever seen at the fair. These fairs are largely attended, the attendance reaching 100,000 during the week. I see many men before me who have done the state worthy service, and I simply want to say to you that the officers of the State Agricultural Society appreciate your co-operation and help, and expect its continuance. (Applause).

The President: Mr. Gibbs has something to present at this time of interest to us all, and as our program is completed up to date, it is a very appropriate time now to bring up the subject which he wishes to present.

Mr. Gibbs then presented to the society a group picture of ten veteran members of the State Horticultural Society, and also a portrait of Mr. J. S. Harris. (See index, "Presentation of Photographs.")

Miss Emma V. White then read the following poem, taking as her subject the occasion of the picture presentation. (See index, "Veterans of Horticulture.")

This reading was followed by a few happy remarks by the president and a feeling response by Mr. Harris. Other speakers on the occasion were Sec. Geo. H. VanHouten and C. L. Smith.

THURSDAY EVENING SESSION.

Thursday evening was given over to the students of the State Agricultural School who, under the management of Prof. Green, provided a most enjoyable entertainment.

The program was opened with music by the school orchestra, after which President Underwood introduced Dean Liggett, who made a few remarks, to which President Underwood briefly responded.

Following is the program as rendered:

Essay—	LEAVES AND GRASSES. Miss Willa Wilcox, Hugo.	
Music—	MANDOLIN SOLO. "Legendre." Guy Merrill.	
Essay—	A SUMMER'S WORK OF HORTICULTURE. Max W. Buell, St. Anthony Park.	(See index).
Essay—	INSECTS INJURIOUS TO WINDBREAKS. Humboldt Lugger, St. Anthony Park.	(See index).
Music—	COMBINED ORCHESTRA.	
Essay—	LEAVES AND GRASSES.—*Continued.* Grace Andrews, Faribault.	
Essay—	RASPBERRY AND BLACKBERRY CULTURE. Leslie Widmoyer, Dresbach.	(See index).
Music—	THE MERMAID. Male Quartette.	
Essay—	CHEMISTRY IN HORTICULTURE. Roy W. Herrick, Minneapolis.	(See index).
Recitation—	LASCA. G. R. Ingalls.	
Music—	COMBINED ORCHESTRA.	

FRIDAY FORENOON SESSION.

The first matter taken up was the report of the "Committee on Ornamental List," by L. R. Moyer, Montevideo, and its discussion. (See index).

The President: We will now have a subject which should have the greatest interest for us all. I will now call for Mr. Choate's address.

"Your Interest in an Improved Highway." A. B. Choate, Minneapolis. (See index).

Discussion.

Mr. Murray: It seems to me the paper we have just listened to is the most practical I ever heard. It is so excellent that I think we should take some recognition of it, if nothing more than to offer the writer a vote of thanks, and I move that we

tender Mr. Choate a hearty vote of thanks for his very able and practical paper.

The motion was numerously seconded and unanimously prevailed.

Mr. Choate: I thank you very much for the interest you take in this matter and the way you have received this paper. I feel gratified without any expression of thanks, because it is a hobby of mine, and I do not feel that I deserve any particular thanks, for any man who has a hobby feels that he is sufficiently rewarded for what he does.

Mr. Dartt: I voted to extend this vote of thanks, and I think we owe the gentleman a vote of thanks on the merits of his paper, but I voted with a mental reservation that his comparisons were odious. (Laughter).

"Best Three Evergreens for Shelter." Chas. T. Hawkinson, Minneapolis. (See index).

Discussion.

The President: We will now listen to a paper on the subject of evergreens by Mr. Wheaton.

"How to Grow an Evergreen Windbreak in Western Minnesota." D. T. Wheaton, Morris. (See index).

Discussion.

"Is a Farm Hedge Fence Practicable or Desirable in Minnesota?" J. P. Andrews, Faribault. (See index).

The President: It is now the noon hour, and we will not have time to discuss this paper. We will now stand adjourned until two o'clock this afternoon.

FRIDAY AFTERNOON SESSION.

The President: It is time for us to begin our program for this afternoon. Some of our members are anxious to get through, and we have quite a long list of papers to take up this afternoon. We will first listen to a paper by Mr. Wyman Elliot.

"Transplanting Evergreens from the Woods." Wyman Elliot, Minneapolis. (See index).

"The Uses of Evergreens About the Home." F. H. Nutter, Superintendent of Parks, Minneapolis. (See index).

"The Transplanting and Subsequent Care of Evergreens." J. S. Harris, La Crescent. (See index).

The President: Now we have had three papers read without discussion. Is there any discussion to follow these papers, or

has any one any remarks or suggestions to make, or any questions to ask of those who read the papers?

A general discussion ensued.

"Pines That Succeed in Minnesota." Prof. W. W. Pendergast, Hutchinson. (See index).

Discussion.

Mr. Brand then submitted the following report as chairman of the committee on the secretary's report.

REPORT OF COMMITTEE ON SECRETARY'S AND TREASURER'S REPORTS.

Your committee reports that we have examined and compared the vouchers and receipts, called for by us, and find them correct.

Respectfully submitted,

O. F. BRAND,
Chairman of the Committee.

On motion of Mr. Harris, the report was accepted and adopted.

"Shelter Belts in the Red River Valley." D. R. McGinnis, St. Paul. (See index).

Discussion.

Mr. Bush: I have a report here on the president's address, which I would like to submit.

Mr. Bush then submitted the following report of the committee on president's address: (See index).

On motion of Mr. Elliot the report of the committee was adopted

The Secretary: I have the following resolution I wish to offer:

"Resolved, That the public examiner of the state be requested at as early a date as possible to examine the books of this society and make a report thereon, and to examine the books of this society annually hereafter."

Mr. Wedge: I move the adoption of that resolution.

The motion, being put, unanimously prevailed.

Mr. Bush: In consideration of this matter which has just come up, that the report submitted on the reports of the secretary and treasurer was a minority report, may I have the privilege of presenting the other, the majority report?

The President: We will now listen to the majority report of the committee on the reports of the secretary and treasurer. You understand there was a committee appointed yesterday for that purpose yesterday, the committee consisting of Mr. Brand as chairman, Mr. Bush and Mr. Richardson. Mr. Brand

made a minority report. Mr. Bush wishes to make a majority report.

Mr. Bush then submitted the following majority report on the reports of the secretary and treasurer, which was received with much applause.

MAJORITY REPORT OF COMMITTEE ON SECRETARY AND TREASURER'S REPORTS.

Your committee report that we have examined and compared vouchers and receipts, called for by us, and find them *correct* in every instance, having carefully considered each individual charge and insinuation of dishonesty and personal favoritism, and fail to find any evidence of either, and believe that the office of our society is ably managed in the best interest of the society, with a view of its doing the greatest good to the largest number.

S. D. RICHARDSON,
A. K. BUSH.

On motion of Mr. Jewett the report was unanimously adopted by a rising vote.

The President: We will now listen to a paper that was written by Mr. J. O. Barrett, the secretary of the State Forestry Association. Mr. Barrett is unable to be with us, and Prof. J. L. Dobbyn will read the paper.

"Evergreens on our Western Prairies." J. O. Barrett, Brown's Valley. (See index).

"Our Native Cedars and their Uses." D. R. McGinnis, St. Paul. (See index).

The President: This finishes our program, and we will now take up any unfinished business we may have to dispose of. Is there any unfinished business to come before the society before we take our final adjournment?

Secretary Latham: I would like to give notice of a proposed amendment to the constitution. Of course, this cannot be acted upon until our next annual meeting.

The secretary then read the following proposed amendment to the constitution:

NOTICE OF AMENDMENT TO THE CONSTITUTION.

Amend Article III, of the constitution by adding the words:
"No member shall vote at any election of officers except those who have been members for not less than two consecutive years immediately preceding that in which the election is being held."

Mr. J. S. Harris introduced the following resolution relative to the congressional free seed distribution: (See index).

Discussion.

The President: We still have some time left on our hands before adjournment, and we would like to hear from any one who has anything to say. Perhaps Mr. Bryant would like to say a few words to us before we adjourn.

Mr. Bryant, (Illinois): I want to express the great pleasure I feel in meeting with you here, and the great pleasure I have felt in the courtesy you have shown us, and to express my gratification at the splendid exhibition of fruit you have made here. Another thing that has pleased me very much is the appreciation you show for your members, your old members while they are still engaged in active work in the society. This strikes me as a very proper and appropriate recognition of their services by calling attention to it before they go. I thank you very much for the various courtesies you have shown me. We hold our meeting the last of the month at Springfield, and we should be very glad to have you send a delegate there, if it is convenient, and I will promise that we will do the best we can to make his visit agreeable and profitable.

The President: It has afforded us a great deal of pleasure to have you and your companion with us, and to have a representative from the Illinois society present to take part in our deliberations, and I might also say it affords us a great deal of pleasure to have representatives from the various societies with us. I have been pleased to see that they are so prompt and willing to take part in our deliberations, and have assisted us much in our work by their words of encouragement and counsel. We shall always be glad to welcome them in our midst.

Secretary Latham: I wish to make a motion that the visiting delegates and friends at this meeting be made honorary members for the ensuing year.

The motion was seconded and, being put to vote, unanimously prevailed.

Mr. T. T. Smith: In line with the motion adopted, which was made on the resolution presented by Mr. Harris in regard to the free seed distribution, I want to make a motion that the secretary be instructed to send a copy of that resolution to the various state societies that are interested in agriculture and horticulture. To send copies to horticultural and agricultural societies of other states and request them to carry on the good work and communicate with their members of congress to the same effect as provided for in the resolution.

The motion was seconded and unanimously carried.

The President: I think we have overlooked the report of the committee on obituaries and the committee on final resolu-

tions. If Mr. Harris is ready to report we will hear from him first.

Mr. Harris, in behalf of the committee on obituaries, then presented the following report: (See index).

Mr. Wedge, as chairman of the committee on final resolutions, submitted the following report:

FINAL RESOLUTIONS.

WHEREAS, We, the rank and file of the State Horticultural Society, have greatly enjoyed and profited by the past meeting and realizing that many circumstances have contributed to the end, we desire to express our appreciation and thanks by the following resolutions:

Resolved, That we are under obligations to the officers of Hennepin county for the use of rooms most admirably adapted to our purposes, situated in a building of such beauty and magnificence as to be a continual source of wonder and delight.

Resolved, Thanks are due to the citizens of Minneapolis for their interest in our welfare, shown by their attendance upon our meetings and many expressions of hospitality.

Resolved, That the session spent with the students of the school of agriculture, was one of the most delightful within our experience, and we earnestly hope that a similar evening program may be one of the features of every annual meeting.

Resolved, That notice is due of the unusually comfortable and convenient quarters provided for many of us at the Hotel Vendome.

Resolved, That we regard the program for this year's meeting as being very full and satisfactory, and we extend our thanks to the officers who have guided the proceedings in so fair and satisfactory a manner.

Resolved, That thanks are due Howard, Farwell & Co., for the use of their piano, and to the singers who have entertained us and added variety to our sessions.

Respectfully submitted,

CLARENCE WEDGE,
THOS. L. SMITH,
J. W. MURRAY.

On motion of Mr. Harris the report of the committee was adopted.

The President: Now before we adjourn we would like to hear a few words from those who may feel like saying anything in the way of encouragement or advice. Perhaps Mr. Wedge would like to make a speech.

Mr. Harris: I have always been in the habit of making a little speech at the close of the session, realizing that it might be the last time I could ever speak to you. I am in no mood for a speech this afternoon; the way I was treated yesterday took all the speech-making out of me, but the "old man" feels good, it makes him feel

good to realize that from the small beginning thirty years ago when he had the privilege of being one of the dozen members who organized this society, today it has a membership of over five hundred. It makes him feel good to see that there is a disposition to improve the home grounds, the school yard and the last resting place of the dead. I would ask nothing better than to have an old apple tree planted over my last resting place. I feel gratified and proud to see the work our society is accomplishing, and I trust it will keep on doing good through all the ages to come. (Applause).

The President: I see the secretary has put the president on the program to make a speech. I am not in the humor to make a speech if that were possible. I feel as though I had enough to do without being called on to make a speech. I have considerable on my mind to digest, and I am hardly in a condition to give forth anything until I have digested what I have received. I can only express my heartfelt thanks to the members of the society for their kindness to me. I want to thank you from the bottom of my heart for the very considerate manner in which you have treated me and for everything you have done to make the meeting of the society a success. The promptness with which you have responded to the program has been very gratifying to me, and I am particularly gratified with the expressions you have given of your approval of the work that I have done. I heartily second the remarks that have been made in regard to increasing the membership of our society in our immediate vicinities. I know very much could be done in that way; I know it from the little that I have done myself; and it will be just as easy for any one to do the work that Mr. Bush has done. I have often thought I would make a missionary of myself in my immediate neighborhood, and perhaps in the year to come I will do some work of that nature myself. I hope you will all feel encourged to work for the welfare of the society, knowing and feeling that you are doing a good work for the community in which you live. I thank you again for your kindness and considerate treatment of me in my official capacity, and trust we may all greet one another at our next annual meeting.

If there is nothing further to come before the society I will declare the annual meeting adjourned.

RECORD OF MEETINGS OF EXECUTIVE BOARD FOR 1898.

Dec. 7, 1897, County Commissioners' Room, Court-House, Minneapolis.

All the members being in attendance, the accounts of the secretary and treasurer for the year ending Dec. 7, 1897, were examined and found correct.

The following bill was approved and ordered paid:

A. W. Latham, Secretary, expenses of secretary's office from June 23, 1897, to Dec. 6, 1897, $292.47.

Adjourned *sine die.*

A. W. LATHAM, Secretary.

WYMAN ELLIOT, Chairman of Executive Board.

Dec. 10, 1897, County Commissioners' Room, Court-House, Minneapolis, 1:30 p. m.

All the members of the Board were present except L. R. Moyer.

A committee, consisting of Wyman Elliot, J. M. Underwood and A. W. Latham, was appointed to prepare the program for the next annual meeting.

The following standing committees were appointed for the coming year:

Seedling Fruits: J. S. Harris.

Fruit List: Clarence Wedge, J. P. Andrews and Prof. S. B. Green.

Ornamental List: F. H. Nutter, L. R. Moyer and Fred Nussbaumer.

Nomenclature and Catalogue: J. S. Harris and Prof S. B. Green.

Legislature: Wyman Elliot, J. M. Underwood, D. R. McGinnis, J. S. Harris, Prof. W. M. Hays and A. W. Latham.

Publication: Prof. S. B. Green, Wyman Elliot and A. W. Latham.

Delegates to annual meetings of adjacent state horticultural societies were appointed as follows:

Wisconsin, Clarence Wedge; Iowa, A. K. Bush.

Bills were approved and ordered paid as follows:

A. W. Latham, Secretary, premiums paid at annual (1897) meeting 106.25
Clarence Wedge, expense of executive board and of orchard investigations ..... $ 22.06

Adjourned *sine die*

A. W. LATHAM, Secretary.
WYMAN ELLIOT, Chairman of Executive Board.

March 7, 1898, Secretary's Office, Minneapolis, 4 p. m.

The following members were present: S. B. Green, J. S. Harris, J. M. Underwood, J. P. Andrews, Wyman Elliot and A. W. Latham.

The chairman, Wyman Elliot, not being present at the beginning of the meeting, J. P. Andrews was chosen chairman *pro tem.*

Wyman Elliot was elected chairman of the executive board for the current year, and A. W. Latham, secretary, at an annual salary of $800.00.

The salaries of the president and treasurer were fixed at $25.00 each for 1898, the president, however, declining to receive any salary for his services.

The president and secretary were authorized to solicit contributions for a fund to be tendered to Mr. P. M. Gideon in recognition of his services to the state in the propagation of seedling apples.

The horticultural section of the 1898 state fair premium list as prepared by Messrs. Elliot and Latham was examined and approved.

Adjourned *sine die.*

A. W. LATHAM, Secretary.
WYMAN ELLIOT, Chairman Executive Board.

June 25, 1898, Armory Hall, Agricultural School, St. Anthony Park.

All the members were in attendance.

The following bills were audited and ordered paid:

A. W. Latham, expenses of secretary's office, etc. $655.32
" premiums summer meetings, 1898 ..... 68.50
J. S. Harris, expenses of executive board 12.85

It was decided to expend $300 (three hundred dollars) in the purchase of books for the library, and Messrs. Elliot, Moyer, Harris, Green and Latham were appointed a committee to have charge of the matter.

The secretary was instructed to correspond with the officers of the Wisconsin and Iowa horticultural societies as to a joint meeting of committees from each society to agree upon the nomenclature of the Russian apples being grown in the northwest, and Messrs. Wedge, Green and Harris were appointed a committee to represent this society on that occasion.

It was determined that the executive board in a body visit the Owatonna experiment station on August 23rd next.

In conformity to the wishes of the society as expressed in a resolution at the summer meeting, held today, the secretary was instructed to pay to Mr. P. M. Gideon, to aid him in his experiment work, the sum of one hundred dollars.

Adjourned *sine die*.

A. W. LATHAM, Secretary.

WYMAN ELLIOT, Chairman Executive Board.

LIST OF MEMBERS, 1898.

Annual Members.

Anderson, Nils.....Lake City
Adams, J. L.....Glenwood
Anderson, Louis.....Rochester
Anderson, Erick.....Lake Park
Akin, D. F.....Farmington
Andrews, J. P.....Faribault
Aarons, Ben.....329 E. 26th st., Mpls.
Albee, Wm. E.....1015 Mary Place, Mpls.
Austin, L. E.....Glencoe
Allen, Clark.....Boyd, Wyo.
Ackerman, O. D.....Banks
Anderson, Frank.....La Crescent
Aschenbeck, J. H.....731 4th ave. N., Mpls.
Aspinwall, N. P.....Wahpeton, N. D.
Avery, H. A.....Austin
Ayers, Oscar.....Austin
Aultfather, C. F.....Austin
Arneson, A. N.....Wegdall
Allen, W. H.....Granite Falls
Abbott, C. A.....Saratoga
Anderson, O. W.....Mankato
Anderson, Oliver.....Britt, Ia.
Anderson, G. W.....Eureka
Anderson, E. F.....New Canada
Alton, D. D.....Fairmont
Alton, Mrs. Geo. B.,
1601 University ave. S. E., Mpls.
Byrnes, A. & Co.....Minneapolis
Bisbee, A. C.....Lyle
Becker, J. C.....Adrian
Buck, Daniel.....Mankato
Broman, August.....Atwater
Bost, A. A.....Excelsior
Bang, Olaf.....Hoyt
Buttermore, B. H.....Lake City
Blair, C. L.....Clyde
Budlong, E. E.....Glenville
Brunsdale, K. H.....Hatten, N. D.
Bennett, Richard.....Montrose
Brewster, Prof. H. W.....St. Anthony Park
Bednar, G.....Silver Lake
Benton, H. W.....301 N. Y. Life, Mpls.
Barrett, Mrs. J. O.....Brown's Valley
Barton, Mrs. I.....Excelsior
Brown, J. A.....Windom
Beckley, J.....Nerstrand
Burch, H. D.....Excelsior
Bush, A. K.....Dover
Barlow, Geo. W.....Sheridan, Wyo.
Bass, J. G.....Hamline
Brimhall, W. H.....Hamline
Bergmeier, F. W.....140 E. 3d st., St. Paul
Bull, Jas. E.....Edina Mills
Burns, Martin.....Court-House, Mpls.
Beardsley, E. P.....Clinton Falls
Brown, Mrs. E. J.....3000 Pleasant ave., Mpls.
Broberg, Theo. O.....Waconia
Bedford, S. A.....Brandon, Manitoba
Bisbee, John.....Madelia
Barnard, Mrs. M. M.....805 7th st., S. E., Mpls.
Bigelow, F. W.....3433 Garfield ave., Mpls.
Brown, C. F.....St. Peter
Bacheller, T. T.....Box 594 Mpls.
Baird, L. D.....Austin
Belden, O. D.....Austin
Bliss, G. W.....Austin
Birkett, H.....Austin
Boelk, F.....Lansing
Booth, D. T.....Willmar
Bergquist, C. O.....Willmar
Brown, H. A.....Brownsdale
Berg, C. L.....Wegdall
Bailey, Ernest.....Elk River
Brink, Peter.....Rochester
Brown, Mrs. J. H.....Owatonna
Barnes, W. K.....Alexandria
Baird, Prof. Andrew B.,
247 Colony st., Winnipeg, Man.
Barnes, Samuel, 413 Washburn Bldg, St. Paul
Bremer, Geo.....Cannon Falls
Bushey, Dr. M. E.....Arlington
Baker, G. A.....Janesville
Bullis, L. I.....Winnebago City
Birkett, N.....Ellsworth
Blood, J. W.....Park Rapids
Bingham, J. J.....Britt, Ia.
Baker, Alvin.....Britt, Ia.
Brown, Samuel.....2909 W. 3d st., Duluth
Brinteson, O. G.....223 E. 6th st., Duluth
Broughton, A. L.....511 4th ave., S. E., Mpls.
Blethen, Chas. E.....Walnut Grove
Boutelle, F. E.....Northfield
Bradt, Sec'y., H. H. G.....Eureka, Wis.
Bragestad, J. N.....Box 648, Decorah, Ia.
Buel, Max W.....St. Anthony Park
Baker, H. G.....Austin
Brackett, A. H.....Long Lake
Bailey, J. V.....Newport
Bunnell, M. C.....Newport
Choate, A. B.....Temple Court, Mpls.
Cary, Miss Ethelind.....Mandan, N. D.
Cash, W. H. H.....New Lisbon, Wis.
Cook, F. L.....Spearfish, S. D.
Christian, C. H.....Bloomfield
Cross, Mrs. E.....Sauk Rapids
Cook, Dewain.....Windom
Collins, P. V.....Guaranty Loan, Mpls.
Cross, J. N.....600 N. Y. Life, Mpls.
Christianson, Peter.....Hutchinson
Classen, Jos.....Loretto
Coe, Wm. S.....Temple Court Mpls.
Carroll, R. C.....St. Anthony Park
Campbell, J. W.....115 Spruce Place, Mpls.
Coe, Sarah E.....Holmes Hotel, Mpls.
Condit, L. A.....Court-House, Mpls.
Cooley, Geo. W.....3016 Lyndale S., Mpls.
Crooker, Mrs. E. B.....2212 Oakland ave., Mpls.
Cuzner, E. A., Essex and 27th ave. S. E., Mpls.
Cuzner, Mrs. E. A., Essex and 27th S. E., Mpls.
Cummins, Mrs. J. R.....Washburn
Cummins, Oswald.....Eden Prairie
Connor, C. W.....Sac City, Ia.
Charlson, S.....Sogn
Comee, S. S.....Waseca
Crandall, Geo. O.....Rockford
Campbell, A. C.....Fremont, Neb.
Crawford, M.....Cuyahoga Falls O.
Cook, Mrs. Louisa.....Hutchinson
Clemons, L. A.....Storm Lake, Ia.
Crane, F. I.....Austin
Catherwood, S. D.....Austin
Cowles, F. J.....West Concord
Christgan, John.....Sutton
Cannon, James.....Box 10, LeRoy
Carnal, F. A.....Cannon Falls
Currie, Hugh.....Clyde
Crooket, E. D.....35 W. 33d st., Mpls.
Chrun, Derwin.....Park Rapids

Chalmers, W. H.....Lac qui Parle
Cooper, Edward.....Adrian
Cashman, T. E.....Owatonna
Crowther, A. T.....Fairmont
Clark, Dr. E. F.....Eureka
Carlson, C. E.....Hancock
Coffin, W. F.....Hamlin
Day, L. E.....Clinton Falls
Darrow, H. F., Western & Selby avs., St. Paul
Dowers, E.....255 1st ave. S., Mpls.
Darling, D. F., 42d st. and Queens ave. S. Mpls.
DeLamater, D. P., 2454 Bloomington av., Mpls.
Doolittle, C. J.....Evansville, Wis.
Dickson, John.....Rockford
Drake, G. W. N.....Monticello
Davidson & Co. 112 E. Front st., Cincinnati, O.
Deming, Jessie.....Austin
Decker Bros.....Austin
Dinsmore, I. J.....Austin
Danforth, Wm. Jr.....Red Wing
Dewey F. D.....Selma
Dahle, G. A.....Brownsdale
Dahle, S. K.....Brownsdale
Davis, R. E.....Park Rapids
Deming A.....Park Rapids
Davis, Francis.....Goodhue
Davis, J. P.....Dasseli
Dike, C. C.....White Bear Lake
DeOou, Franklin.....276 Jackson st., St. Paul
Deters, B. H.....Elizen
Endsley, P. M.....620 E. 16th st., Mpls.
Elwell, T.....1064 16th ave. S. E., Mpls.
Eklof, John.....Stockholm
Ellergodt, H. C.....Lanesboro
Eddy, W. H.....Howard Lake
Ekgren, Y. P.....Waverly Mills
Ernst, N. C.....Dodge Center
Ellis, Gertrude.....Austin
Elwell, George H.....1063 13th ave. S. E., Mpls.
Erickson, Peter.....Elk River
Eberhard, H. P.....Mound Prairie
Evans, W. J.....Chatfield
Ensberg, S.....Toronto, S. D.
Empenger, F. J.....St. Louis Park
Emery, W. A.....Champlin
Erickson, G. O.....2002 W. 1st st., Duluth
Erickson, B. C.....2002 W. 1st st., Duluth
Emkee, Fred.....Owatonna
Frisselle, Dr. M. M.....Eureka
Furber, J. T.....Madelia
Frankland, Thos.....Stonewall, Man.
Frenn P. J.....Burley
Frederickson, L.....Cobden
Fosseen, M. L.....2714 13th ave. S., Mpls.
Fredman, N. L.....1521 5th st. N., Mpls.
Fryer, W. E.....Mantorville
Facey, M. V.....Preston
Fleischer, J. C.....1119 Charles st., St. Paul
Failing, Eugene.....Lake City
Friend, R. H.....Austin
French, L.....Austin
Freeman, Jonathan.....Austin
French, A. J.....Austin
Freeman, O. W.....Adrian
Fontaine, Louis.....Crookston
Ferguson, W.....Chatfield
Frederickson, S. C.....Cobden
Fleming, Albert.....Garden City
Flatin, G. F.....Spring Grove
Fitzer, Chas.....1329 Fremont ave. N., Mpls.
Fuller, F. A.....Park Rapids
Frazier, L. D.....Park Rapids
Field, J. W.....Park Rapids
Farrar, F. F.....White Bear
Ferguson, O. E.....Luverne
Farmer, J. Q.....Spring Valley
Furlong, J. J.....Austin
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